

Official Register  
of Harvard University  
2000–01



## Harvard School of Public Health

*Advancing the Public's Health Through  
Learning, Discovery,  
and Communication*



## Harvard School of Public Health – Departments and Degree Programs, 2000–01

### **Definition of Terms**

#### **Degrees**

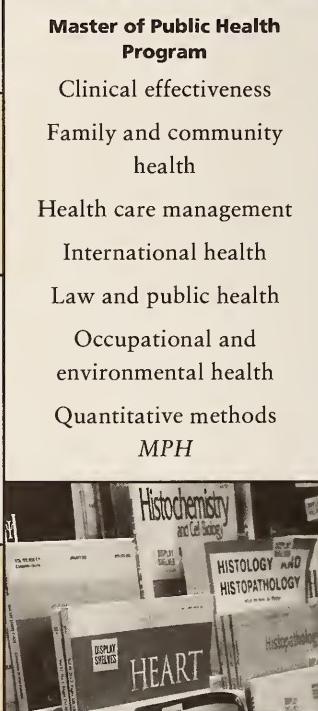
DPH	Doctor of public health
MOH	Master of occupational health
MPH	Master of public health
PhD	Doctor of philosophy
SD	Doctor of science
SM1	Master of science (40-credit program)
SM2	Master of science (80-credit program)

Diplomas for the MPH, DPH, and MOH degrees show the degree only. Diplomas for the SM and SD degrees also show the name of the department.

All PhD programs are offered under the aegis of Harvard University's Graduate School of Arts and Sciences.

#### **Concentrations**

The names of the departments generally convey their educational and research specialization, or *concentration*. Where several concentrations are available within a department, these are listed in the chart at right. In the Department of Environmental Health only, the concentrations are shown on diplomas. *Areas of interest*, described in this catalog but not listed at right, are generally less formal programs than concentrations or are subspecializations within them.

<b>Department of Biostatistics</b> Biostatistics SM1, SM2, SD Health decision sciences SM2, SD	<b>Department of Health Policy and Management</b> Health care management (nonresidential program) SM1 Health policy and management SM1, SM2, SD Health policy PhD (through university program)	
<b>Department of Cancer Cell Biology</b> SD PhD (through the Division of Biological Sciences)	PhD (through university program)	
<b>Department of Environmental Health</b> Environmental epidemiology SM1, SM2, SD Environmental science and engineering SM1, SM2, SD Occupational health MOH, SM1, SM2, SD, DPH Physiology SD PhD (through the Division of Biological Sciences) Population genetics SD	<b>Department of Immunology and Infectious Diseases</b> SD PhD (through the Division of Biological Sciences)	
<b>Department of Maternal and Child Health</b> SM1, SM2, SD, DPH	<b>Department of Nutrition</b> Nutrition SD, DPH PhD (through the Division of Biological Sciences)	
<b>Department of Epidemiology</b> SM1, SM2, SD, DPH	<b>Department of Population and International Health</b> International health epidemiology and ecology SD, DPH International health policy and economics SD, DPH Population and international health SM2 Population and reproductive health SD, DPH	<b>Master of Public Health Program</b> Clinical effectiveness Family and community health Health care management International health Law and public health Occupational and environmental health Quantitative methods MPH
<b>Department of Health and Social Behavior</b> SM1, SM2, SD	<b>Division of Biological Sciences</b> Cancer cell biology Environmental health physiology Immunology and infectious diseases Nutrition PhD	



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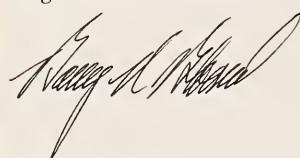
## From the Dean

The twentieth century has witnessed the greatest gains in quality and duration of life. Most of the gains achieved prior to antibiotics and vaccines are truly attributable to public health. In the United States, for example, life expectancy has been extended from an average of 47 years in 1900 to almost 80 years in 2000. Yet there are major disparities in life expectancy and harsh inequities in individuals' ability to get access to the care they need—both in different parts of the world and within this wealthy country. Some infectious diseases have been vanquished, but new ones emerge, such as AIDS, or reemerge in drug-resistant strains. Violence, injuries, the great parasitic diseases that kill and handicap millions, environmental and occupational hazards, and effective health management and financing are just some of the challenges within the purview and mandate of public health. The improvement of the health of the nation's and the world's populations demands diverse professional skills combined with the integration of varied disciplines.

The courses, departments, centers, programs, and facilities described here in the *Official Register* of the Harvard School of Public Health reflect the scope of the contemporary public health enterprise. The interests and expertise of faculty at the school are similarly broad, extending across the biological, social, and numeric sciences. There are programs and projects ranging from the molecular biology of AIDS vaccines to the epidemiology of cancer; from maternal and children's health to quality-of-care measurement; from risk assessment to international health and human rights. All of these programs are approached with a true sense of dedication on the part of the faculty, students, and staff and with a mutual respect for different ways of contributing to our shared purpose.

Our overarching mission is to advance the public's health through learning, discovery, and communication. Our objectives are to provide the highest level of education for public health scientists, practitioners, and leaders; to foster new discoveries leading to the improved health of the people of this country and all nations; to strengthen health capacities and services for communities; and to inform policy debate, disseminate health information, and increase awareness of public health as a public good and a fundamental right.

We are engaged in an enterprise of vital importance to every individual and to society. We welcome those who wish to help us meet these challenges and share the satisfying work of changing the world of health and improving the health of the world.



Barry R. Bloom  
Dean



## The Harvard School of Public Health

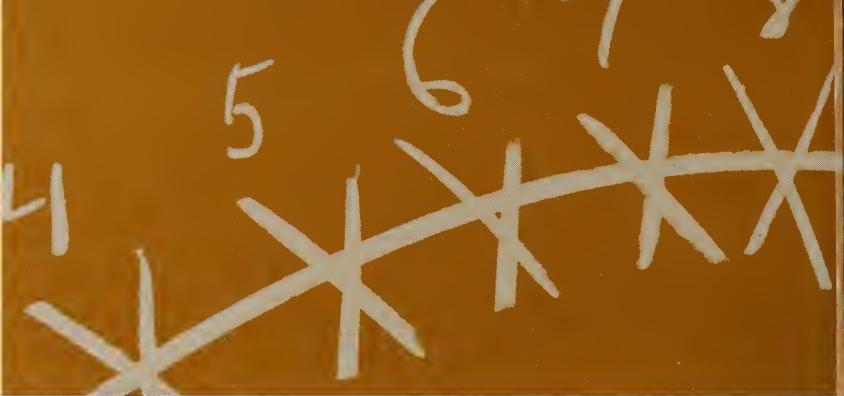
The Harvard School of Public Health is a direct descendant of the first professional training program in public health in America, the Harvard-MIT School for Health Officers, a joint venture that began in 1913. In 1922 Harvard split off from MIT, and the Harvard School of Public Health was formally established. In 1946 the school celebrated its new status as a freestanding faculty of Harvard University, no longer an administrative part of the medical school.

Since its founding, the school, through its faculty and graduates, has been at the forefront of efforts to stem disease and promote health worldwide. During the early years the focus was on infectious diseases, deadly workplace exposures, and sanitation—from Alice Hamilton’s pioneering studies of lead and mercury poisoning, to Thomas Weller’s pathbreaking research on the polio virus and Philip Drinker’s invention of the iron lung. More recently the school has expanded its reach to new areas, including the effects of race, gender, class, and social isolation on health; the reform of national health systems; and cutting-edge research on the biomarkers of disease. Three Nobel Prizes, a Lasker Prize, two MacArthur Awards, presidential citations, and countless other honors attest to the excellence and impact of this work. Five successive HSPH alumni led the U.S. Centers for Disease Control and Prevention (1962–1989) for an unprecedented 27 years. More difficult to quantify—but a far better gauge—are the perceptible gains in length and quality of life realized through all these efforts.



Today the faculty of the Harvard School of Public Health includes almost 350 members from the diverse fields and disciplines that constitute public health. The student body comprises over 800 individuals from throughout the United States and three dozen other countries. Students, like faculty, come from an array of fields and include physicians (40 percent of the student body), health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. Approximately one-third of HSPH students are enrolled in the interdisciplinary master of public health program, one-third in master of science programs, and one-third in doctoral programs.

The school is organized into ten academic departments, the locus of most teaching and research activity; two interdisciplinary divisions (Biological Sciences and Public Health Practice); the Office for Professional Education (for the MPH program); and fifteen specialized research centers. The school’s academic programs are described in detail here in the *Official Register*.



**Faculty in the Department of Biostatistics contribute to the theory and practice of statistical science as it is applied to the biomedical and health sciences. The department prepares students for careers in the fields of biostatistics and health decision sciences.**

## Department of Biostatistics

The programs offered by the Department of Biostatistics provide rigorous training in the development of methodology, collaboration, teaching, and consultation on a broad spectrum of health-related problems. The faculty includes leaders in the development of statistical methods for clinical trials and observational studies, studies on the environment, animal experiments, and longitudinal studies. Members of the department participate in large multidisciplinary projects and serve on many national and international advisory committees. The department's research in statistical methods and its interdisciplinary collaborations provide many opportunities for student participation.

Current departmental research includes the development of statistical and computing methods for clinical trials, including survival and sequential analysis methodology; environmental and epidemiologic research, including methods for longitudinal studies, analyses with incomplete data, and meta-analysis; statistical aspects of the study of AIDS and cancer; collaborative clinical research in the treatment of cancer and AIDS; quantitative problems in health-risk analysis, technology assessment, and clinical decision making; statistical methodology in psychiatric research and in genetic studies; Bayesian statistics; statistical computing; computational biology; and collaborative research activities with biomedical scientists in other departments at HSPH, Harvard Medical School, and affiliated hospitals.

### Degree Programs in Biostatistics

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs and a doctor of science (SD) program with a concentration in biostatistics, as well as an 80-credit SM program and an SD program concentrating in health decision sciences. Detailed information about requirements and elective options can be found in a handbook distributed by the department.

### **Master of Science in Biostatistics (80-credit program)**

**Biostatistics.** The main purpose of the 80-credit SM program with a concentration in biostatistics is to prepare students for doctoral study, although a limited number of qualified students may pursue the master's degree only.

Of the 80 credits necessary to earn this degree, 2.5 credits must be used to fulfill the schoolwide epidemiology requirement (EPI 200 or EPI 201), and 25 credits must be earned in the following core courses: BIO 230, *Probability Theory and Applications I*; BIO 231, *Statistical Inference I*; BIO 232, *Methods I*; BIO 233, *Methods II*; and BIO 235, *Regression and Analysis of Variance*. An additional 15 credits must be chosen from biostatistics courses at the level of BIO 210 or higher (but below 300), of which 10 credits must be chosen from a specific list of biostatistics, health policy and management, and interdisciplinary offerings. In addition to formal course work, students acquire experience in the planning of experiments and the analysis of data by participating in a consulting seminar. Students also choose from a variety of elective courses.

**Health decision sciences.** The concentration in health decision sciences offers integrated educational training in decision sciences within the context of health problems. This program draws on courses offered by the Departments of Biostatistics and Health Policy and Management. A related 80-credit SM program with an area of interest in health research is offered by the Department of Health Policy and Management.

Of the 80 credits necessary to earn the SM, 2.5 credits must be used to fulfill the schoolwide epidemiology requirement (EPI 200 or EPI 201), and students must complete the following core courses: HPB 280, *Decision Analysis for Health and Medical Practices*, or HPM 286, *Decision Analysis in Clinical Research*; HPB 281, *Methods for Decision Analysis in Public Health and Medicine*; HPE 284, *Decision Theory*; HPM 287, *Research Seminar on Risk and Decision Analysis*;

HPM 288, *Management Science*; HPM 289, *Practicum in Decision and Cost-Effectiveness Analysis*; HPM 299, *Analytical Methods in Risk and Decision Sciences*; BIO 230, *Probability Theory and Applications I*; BIO 231, *Statistical Inference I*; and preparation in computing. Ten additional credits must be earned from the health decision sciences core and extended core (see list under SD program), along with at least 10 additional credits in biostatistics. The consulting requirement may be met by obtaining practical experience under the tutelage of a faculty member. Students also choose from a variety of elective courses.

### **Master of Science in Biostatistics (40-credit program)**

**Biostatistics.** Like the 80-credit SM program, the main emphasis of the 40-credit program with a concentration in biostatistics is the preparation of students for doctoral study. The program is designed for students who have a master's degree in one of the mathematical sciences or a doctorate in a quantitative field. Applicants must have a mathematical and statistical background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program. As courses must be taken out of sequence to complete the program in one year, considerable background in probability and statistical inference is needed.

The requirements for this degree are essentially the same as for the 80-credit program. The 25-credit core must be completed, although students who have taken equivalent course work elsewhere may petition to substitute more advanced courses. Greater flexibility is allowed in the other requirements since only 40 total credits are required. Other courses are selected in consultation with a faculty adviser to complement and extend the student's previous training in biostatistics.

The department does not offer a 40-credit program in health decision sciences.

For more information about research and training in biostatistics, please contact Carolyn Dueck, administrator, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1056

Fax: 617-739-1781

E-mail: dept@hsph.harvard.edu

Web: www.biostat.harvard.edu

For more information about research and training in health decision sciences, please contact Milton C. Weinstein, PhD, Department of Health Policy and Management, 718 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-0805

E-mail: mcw@hsph.harvard.edu

**Kevin Roberts****Master of Science Student**

Growing up in New York, Kevin Roberts was always interested in mathematics, so his current path is not surprising. After graduating from Hampton University in Virginia with a degree in mathematics, Roberts came to HSPH to get his master of science from the Department of Biostatistics. "The field

appeals to me because it deals with statistics as it applies to environmental and biomedical research," Roberts notes. At HSPH he has been working on research involving the uptake of chemical pollutants in different tissues in the body.

Once he receives his SM, Roberts will stay on at HSPH, enrolling in the doctoral program in biostatistics. Roberts would like to teach probability or conduct research in collaboration with medical researchers.

***Doctor of Science in Biostatistics***

**Biostatistics.** The doctoral concentration in biostatistics is designed for those who have demonstrated both interest and ability in scholarly research. Qualified applicants may apply directly to the doctoral program without a prior advanced degree. Candidates must complete a minimum of two academic years of full-time study in residence at HSPH; pass the written departmental comprehensive examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis.

Beyond the schoolwide requirement of introductory epidemiology (EPI 200 or EPI 201), the course work for the program is built on a 30-credit core curriculum that includes BIO 230, *Probability Theory and Applications I*; BIO 231, *Statistical Inference I*; BIO 232, *Methods I*; BIO 233, *Methods II*; BIO 235, *Regression and Analysis of Variance*; and BIO 251, *Statistical Inference II*. In

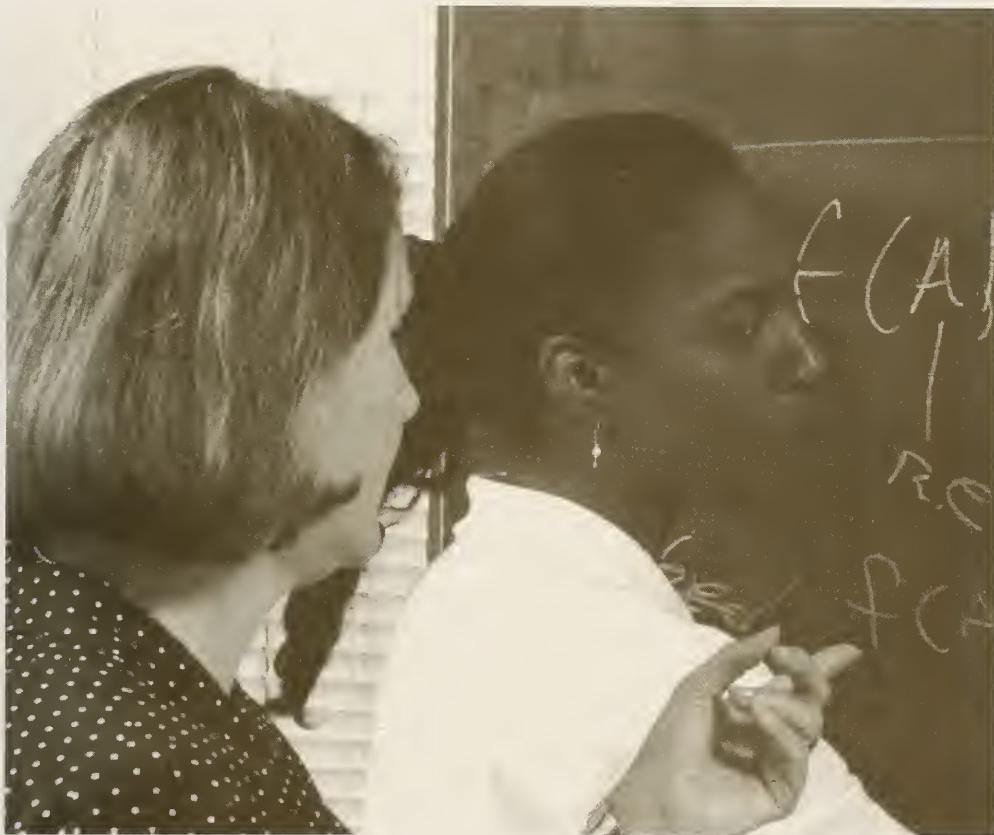
addition, 25 credits of biostatistics courses at the 230 level or higher (but below 300) are required; these courses are chosen by the student in consultation with an adviser. Students must also complete two minors (10 credits each), only one of which may be quantitative (such as theoretical statistics, biomedical computing, health decision sciences, or epidemiologic methods), whereas the other must be substantive (such as the biology of cancer or AIDS).

Doctoral students are required to participate as a teaching assistant in a course offered by the department. In order to acquire experience in the planning of experiments and the analysis of data, students must take a consulting seminar.

**Health decision sciences.** The doctoral concentration in health decision sciences offers integrated educational training in decision analysis, cost-benefit and cost-effectiveness analysis, behavioral decision theory, operations research, applied welfare economics, statistical inference, computer science, and biostatistics—all within the context of health problems. This program is coordinated with but distinct from the decision sciences concentration in the universitywide PhD Program in Health Policy, described under Health Policy and Management.

Candidates must complete a minimum of two academic years of full-time study in residence at HSPH; pass the written departmental comprehensive examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis. The program requires 45 credits of course work in the major field, plus 10 credits in each of two minor fields, one of which must be biostatistics. Health policy and management is acceptable for the other minor, provided the courses focus on subject-oriented rather than quantitative material.

The course work includes the schoolwide requirement of introductory epidemiology (EPI 200 or EPI 201); BIO 230, *Probability Theory and Applications I*; BIO 231, *Statistical Inference I*; 30 credits from the health



decision sciences core; and 10 credits from the extended core. The core includes the following courses: HPM 206, *Economic Analysis*; HPB 280, *Decision Analysis for Health and Medical Practices*, or HPM 286, *Decision Analysis in Clinical Research*; HPB 281, *Methods for Decision Analysis in Public Health and Medicine*; HPB 282, *Cost-Effectiveness and Cost-Benefit Analysis in Public Health and Medicine*; HPE 284, *Decision Theory*; HPM 287, *Research Seminar on Risk and Decision Analysis*; HPM 288, *Management Science*; HPM 289, *Practicum in Decision and Cost-Effectiveness Analysis*; and HPM 299, *Analytical Methods in Risk and Decision Sciences*. For a list of extended core options, see the department's student handbook.

All doctoral students are required to participate as a teaching assistant in a course offered by the department. In order to acquire experience in decision analysis, students must take a consulting seminar or complete an outside project approved by the seminar director.

For information on postdoctoral fellowships, please contact the chair of the Postdoctoral Committee, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1056

Fax: 617-739-1781

E-mail: dept@hsph.harvard.edu

#### **Related Offerings**

Interdisciplinary Program in Molecular Epidemiology, see page 50.

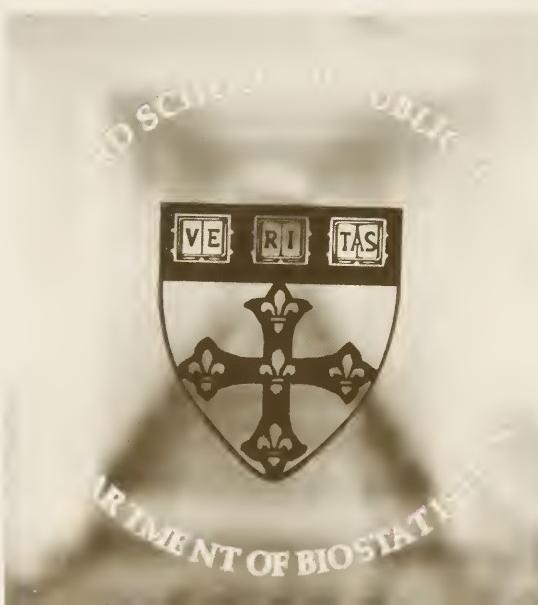
MPH concentration in quantitative methods, see page 48.

PhD in health policy, see page 30.

Health research area of interest, Department of Health Policy and Management, see page 29.

#### **Financial Support**

Funding is available to qualified students pursuing the doctoral degree. Most of the funding is through five biostatistics training grants in AIDS, cancer, the environment, mental health, and public health training for underrepresented minorities. These traineeships require U.S. citizenship or permanent residency. Other limited funding is awarded on a competitive basis to qualified applicants.





*The goal of the Department of Cancer Cell Biology is to conduct and promote research and training on the effects of radiation and environmental chemicals on the health of human beings.*

## Department of Cancer Cell Biology

The Cancer Cell Biology program features laboratory research that combines recent advances and techniques in biochemistry, molecular and cell biology, and genetics to focus on the mechanisms involved in the development of cancer and the means for its prevention. Specific emphases include the growth control of cancer cells; the damage and repair of DNA, particularly in response to chemicals and oxidants present in the environment; and the biological effects of low-dose radiation exposure.

The department has component divisions of radiation biology and toxicology.

### Radiation Biology

The research and training program in radiation biology emphasizes studies at the cellular and molecular levels in an integrated approach to the investigation of the lethal, mutagenic, and carcinogenic consequences of exposure to radiation and chemical agents and the role of genetic instability in the development of cancer. Goals include not only defining the hazardous effects of such exposures but also examining the mechanisms involved in these effects. Although the research encompasses both mechanistic and applied studies utilizing *in vitro* systems, primarily human cells in culture, focus is placed on a molecular-level approach that includes the use of a broad range of molecular biological and recombinant DNA techniques in the study of cell-cycle control, genomic instability, signal transduction, and genetic susceptibility to cancer.

### Toxicology

The research and training program in toxicology explores the interactions of environmental chemicals with a variety of cellular and subcellular systems, the biochemical and molecular mechanisms of toxicity, and the health implications of environmental exposure. As it is often necessary to consider and analyze the relation between chemical, biological, and social factors affecting both the nature of and response to occupational or environmental exposure, the program stresses interdisciplinary approaches that join the power of

modern molecular genetics and cell biology with the problem orientation of public health. Research includes such topics as biochemical and genetic responses to oxidative stress, molecular biology of the repair of DNA damage, mutagenesis in prokaryotes and eukaryotes, genetic recombination and predictive carcinogenesis, and molecular mechanisms of genetic instability in cancer and aging.

### Degree Programs in Cancer Cell Biology

#### *Doctor of Philosophy in Biological Sciences in Public Health (Cancer Cell Biology)*

Students wishing to study in areas relevant to this department should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants must take both the GRE general and subject tests by November in order to meet the application deadline of December 15, 2000.

The PhD program is designed to offer a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in the program engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended successfully before the granting of the PhD.



**Ann Kennedy**

**Richard Chamberlain Professor of Research Oncology,  
University of Pennsylvania School of Medicine**

Ann Kennedy, SD, became interested in radiation and its effects at an early age, starting with her position as Atomic Energy Commission research fellow at the University of Rochester. As a premed student at Vassar, her studies were focused on biology. She went on to receive both her SM and SD from HSPH in radiation biology.

For roughly twenty years Kennedy worked to identify substances that can stop cancer before it starts. More recently, as one of the few women to hold an endowed professorship at the University of Pennsylvania Medical Center, she has been conducting human tests of a soybean-derived protease inhibitor that shows great promise as a cancer-preventive agent.

Since 1988 Kennedy has been a member of the University of Pennsylvania Cancer Center and is the co-director of the Division of Oncology Research. She is also a member of the Radiation Research Society, American Association for Cancer Research, and International Society for Nutrition and Cancer.

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

For more information about research and training in cancer cell biology, please contact Martha Cassin, Department of Cancer Cell Biology, 665 Huntington Avenue, Boston, MA 02115.  
Phone: 617-432-0054  
Fax: 617-432-0107  
E-mail: mcassin@hspf.harvard.edu

For application materials and information about admission to the PhD Program in Biological Sciences in Public Health (program 8500), please contact the Graduate School of Arts and Sciences Admissions Office, Harvard University, 8 Garden Street, Cambridge, MA 02138. Phone: 617-495-5315

Applicants who have specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115. Phone: 617-432-4470  
Fax: 617-432-0433  
E-mail: kenworthy@cvlab.harvard.edu  
Web: [www.hspf.harvard.edu/Academics/dbs/index.html](http://www.hspf.harvard.edu/Academics/dbs/index.html)

#### *Financial Support*

All students admitted to the program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

#### *Doctor of Science in Cancer Cell Biology*

For certain students interested in molecular epidemiology, an SD program is also available. Please contact the department for more information.



## Department of Environmental Health

The Department of Environmental Health focuses on complex problems that require the contributions of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, applied mathematicians, physicians, occupational health nurses, physiologists, cell biologists, molecular biologists, and microbiologists. Teaching and research activities of the department are carried out through five concentrations: environmental epidemiology, environmental science and engineering, occupational health, physiology, and population genetics, as well as several areas of interest (some of which span two or more concentrations). All of these are described below.

### Environmental Epidemiology

Environmental epidemiology focuses on identifying and measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies. The research program integrates epidemiologic methods, physiologic assessment of health, and advanced analytic methods to assess environmental health risks. Problems being investigated include the cognitive and cardiovascular effects of lead, the effects of air pollution on respiratory and cardiovascular health, the effects of infectious agents and disinfection by-products in drinking water, and biomarkers of environmental exposure. The environmental epidemiology concentration has research and training projects under way around the globe, including western, eastern, and central Europe; Latin America; China; and Pacific Rim countries.

Within the concentration a number of areas of interest are offered, including asthma, cancer, cardiovascular disease, chronic respiratory disease, heavy metals, indoor and outdoor air pollution, and radiation. For information on the water pollution area of interest, see the environmental science and engineering concentration.

***The mission of the Department of Environmental Health is to advance the health of all people in occupational and community settings in the United States and around the world through research and training in environmental health. Faculty members in the department study the pathogenesis and prevention of environmentally produced illnesses and act as catalysts for scientifically based public health advances. Research approaches range from the molecular to the epidemiologic.***

## Degree Programs in Environmental Epidemiology

The environmental epidemiology concentration offers both 80-credit and 40-credit master of science (SM) programs in environmental health, as well as a program leading to the doctor of science (SD) degree.

Graduates are prepared for research careers in environmental epidemiology. Recent graduates hold positions in academic institutions, in government agencies, and as private consultants.

### ***Master of Science in Environmental Health (80-credit program)***

The master's programs in environmental epidemiology provide students with basic skills in environmental exposure assessment and epidemiologic methods, in preparation for research or academic careers. The 80-credit SM program is designed for individuals who hold a bachelor's degree and have strong quantitative skills.

Required courses include BIO 200, *Principles of Biostatistics*; EPI 201, *Introduction to Epidemiology*; EPI 202, *Elements of Epidemiologic Research*; EPI 203, *Design of Case-Control and Cohort Studies*; EPI 204, *Analysis of Case-Control and Cohort Studies*; EH 205, *Human Physiology*; EHE 215, *Environmental and Occupational Epidemiology*; and BIO 210, *The Analysis of Rates and Proportions*. Students are encouraged to participate in research seminars within the environmental epidemiology concentration and affiliated groups.

### ***Master of Science in Environmental Health (40-credit program)***

Like the 80-credit program, the 40-credit SM program in environmental epidemiology provides students with basic skills in exposure assessment and epidemiologic methods, in preparation for research or academic careers. The required courses are the same as for the 80-credit SM. The remainder of the schedule reflects areas of specific interest to the students. The 40-credit program is open to applicants with a medical degree or a mas-

ter's degree in a related scientific discipline. Students may enroll on a part-time basis, completing the program over two years.

### ***Doctor of Science in Environmental Health***

Applicants to the SD program in environmental epidemiology should have a master's degree in environmental health, epidemiology, or biostatistics, as well as strong quantitative skills. Doctoral students must fulfill the course requirements for a major in environmental health (20 credits), plus a minor in epidemiology (10 credits) and one other field (10 credits). In addition, they must pass a written departmental comprehensive examination; pass the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis. The thesis consists of three or more publishable papers reporting epidemiologic studies of environmental exposures.

Students interested in a research career are encouraged to apply to the doctoral program in epidemiology with a minor in environmental health. Candidates for an SD in epidemiology must meet all of the requirements of that department.

### ***Financial Support***

Financial support for environmental epidemiology students may be available to U.S. citizens and permanent residents through NIH-sponsored training grants. A training grant from the NIH Fogarty Institute also provides support for fellows and students from the People's Republic of China.

## **Environmental Science and Engineering**

The concentration in environmental science and engineering emphasizes the chemical, physical, microbiological, engineering, and risk assessment aspects of environmental and occupational exposures. Faculty members in the concentration measure and model ambient, indoor, and personal exposures to environmental and workplace contaminants; develop instruments and methods for collecting, analyzing, and assessing the effects

For more information about research and training in environmental epidemiology, please contact Douglas W. Dockery, SD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115. Phone: 617-432-0729 Fax: 617-277-2382 E-mail: ddockery@hsp.harvard.edu

**For more information about research and training in environmental science and engineering, please contact the Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.**

**Applicants to the doctoral program are strongly encouraged to arrange an interview with faculty members. Please contact Linda A. Fox, administrator, Environmental Science and Engineering Program, at the address above (phone: 617-432-4850; E-mail: lfox@hspf.harvard.edu).**

#### **Environmental health sciences area of interest**

##### **Aerobiology:**

**Harriet A. Burge, PhD**

**Phone: 617-432-4638**

**Fax: 617-432-3349**

**E-mail: hburge@hohp.harvard.edu**

##### **Air:**

**Petros Koutrakis, PhD**

**Phone: 617-432-1268**

**Fax: 617-432-3349**

**E-mail: petros@hspf.harvard.edu**

#### **Environmental science and risk management area of interest**

**John Evans, SD**

**Phone: 617-432-1259**

**Fax: 617-432-0190**

**E-mail: jevans@hspf.harvard.edu**

#### **Ergonomics and safety area of interest**

**Jack T. Dennerlein, SM, PhD**

**Phone: 617-432-2028**

#### **Industrial hygiene and occupational safety area of interest**

**Thomas J. Smith, PhD**

**Phone: 617-432-3315**

**Fax: 617-432-4122**

**E-mail: tsmith@hohp.harvard.edu**

#### **Water pollution area of interest**

**Timothy E. Ford, PhD**

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of physical, chemical, and biological factors; and conduct risk evaluations of new products, fuels, water supplies, technologies, and remediation strategies. Collaborative teaching and research are conducted in many countries, including Mexico, Chile, China, Colombia, Greece, Russia, Argentina, Taiwan, Japan, and the Netherlands.

Students specialize in one of the following six areas of interest:

#### **Environmental Health Management**

This area is intended for midcareer professionals with backgrounds in environmental science or engineering and interests in the connections between environmental science and policy in developing countries. Students in the area typically pursue a 40-credit SM program. The specialty consists of a set of core courses in environmental health science, risk assessment, and decision analysis, supplemented by electives chosen to build strength in one of four domains: energy and air pollution policy, drinking water and health, management of chemical wastes and pesticides, or environmental management and strategy.

#### **Environmental Health Sciences**

This area is designed for those interested in identifying and characterizing human and ecological exposures to environmental contaminants. It provides training in air and water environments, environmental microbiology (both aquatic and aeroallergens), radiological health, hazardous and solid waste, exposure assessment, and pollution prevention. Graduates take positions in government agencies, such as the Environmental Protection Agency; in industry; and as consultants. Doctoral graduates also take positions in academia.

Faculty members associated with the environmental science and engineering concentration conduct large national and international research projects in air and water quality, exposure and risk assessment, and radiological health. These projects provide research opportunities for both master's and doctoral students.

#### **Environmental Science and Risk Management**

This area is offered jointly by the Department of Environmental Health and the Department of Health Policy and Management. Providing students with an integrated education in environmental science, risk analysis, and decision making, this area is designed for students interested in pursuing professional and research careers in risk assessment and management in the private or public sector. The SM program is directed toward the growing number of students interested in pursuing careers dedicated to solving problems at the interface between environmental science and public policy. The SD degree prepares students for either professional or research careers.

The curriculum includes course work both in the environmental sciences (for example, human physiology, risk assessment and regulatory toxicology, analytic chemistry and exposure assessment, and environmental and occupational epidemiology) and in the decision sciences (for example, decision, cost-effectiveness, and cost-benefit analysis; environmental and resource economics). These core requirements are supplemented by required courses in biostatistics and electives in environmental policy, law, and management. Although a thesis is not required for the SM degree, each student is expected to complete a practicum in environmental risk and decision analysis.

#### **Ergonomics and Safety**

This area provides a public health and engineering approach to the control and evaluation of occupational hazards for the prevention of work-related musculoskeletal injury and illness. The curriculum prepares graduates to identify and evaluate ergonomic and safety risks in the workplace; identify and evaluate the occurrence of work-related musculoskeletal injury and illness; develop administrative and engineering controls in the design of equipment, work tasks, and workplaces; and develop and assess policies and programs for the prevention of musculoskeletal injuries and illnesses.

## Industrial Hygiene and Occupational Safety

This area is designed for those interested in the anticipation, identification, evaluation, and control of occupational hazards. Graduates take positions at local and federal agencies, such as NIOSH; at private companies with occupational health programs; or at research institutions and universities investigating occupational hazards. Doctoral graduates often fill faculty posts at schools of public health.

Faculty research spans a variety of topics, including retrospective exposure assessment for epidemiologic studies of lung cancer risk from man-made vitreous fibers and exposures to diesel exhaust, physiologic and behavioral determinants of exposure avoidance, toxicokinetic modeling of exposure-dose and exposure-biomarker relationships, and petroleum hydrocarbon exposures associated with adverse effects on reproductive function.

Students in the 80-credit SM program who have limited work experience are encouraged to take a three- or six-month internship between their first and second years of study. Interns work under the supervision of a professional industrial hygienist in a private company or research setting to evaluate occupational hazards and develop applied research skills.

## Water Pollution

Offered jointly with the concentration in environmental epidemiology, this area is designed for those interested in seeking in-depth training in water quality issues, including transmission of waterborne disease, toxicological concerns, and water and waste-water treatment strategies. Faculty research interests include survival and proliferation of pathogens in drinking water, microbial interactions with pollutants, pollutant fate and transport in aquatic ecosystems, and toxicity of disinfection by-products. International issues, especially those of developing countries, are emphasized.

## Degree Programs in Environmental Science and Engineering

As described below, the environmental science and engineering concentration offers both 80-credit and 40-credit master of science (SM) programs in environmental health, as well as a program leading to the doctor of science (SD) degree.

Students in this concentration take the following core courses: EH 205, *Human Physiology*; EH 263, *Analytical Chemistry and Exposure Assessment*; EH 292, *Air Pollution: Properties of Gases and Particles*; EHE 215, *Environmental and Occupational Epidemiology*; EHH 500, *Risk Assessment*; EHH 501, *Regulatory Toxicology*; BIO 201, *Introduction to Statistical Methods*; and EPI 201, *Introduction to Epidemiology*.

Advanced courses in environmental science are oriented toward a specific pollutant or medium (such as air, surface water, or groundwater). They may focus on monitoring, modeling, or the control of the pollutants; or they may emphasize resources and occupational management, regulation, and policy.

In addition to the general core requirements, areas of interest have specific course requirements. Those participating in the industrial hygiene and occupational safety internship program or specializing in hazardous waste are subject to slightly different requirements.

Many students also take courses at MIT and at other Harvard schools, including the Kennedy School of Government and the Faculty of Arts and Sciences.

### ***Master of Science in Environmental Health (80-credit program)***

Applicants to the 80-credit SM program in environmental science and engineering normally hold a bachelor's degree. For study in environmental health sciences, the degree should be in engineering, chemistry, physics, biology, or mathematics; in environmental science and risk management, the preferred degree is in physical science, engineering, or the social and management sciences. Normally students also have several years of work experience in the environmental field.



***Related Offerings***

**Summer Session for Public Health Studies, see page 53.**

For industrial hygiene and occupational safety, the degree should be in engineering, chemistry, physics, or quantitative or molecular biology. For the water pollution area the preferred degree is in engineering, chemistry, physics, biology, or environmental sciences. Applicants with other degrees who have appropriate scientific and quantitative preparation may also be considered. Most applicants have relevant work experience.

***Master of Science in Environmental Health (40-credit program)***

Applicants with exceptional credentials may request consideration for admission to a 40-credit SM program in the areas of environmental health sciences or industrial hygiene and occupational safety. Candidates interested in environmental health sciences normally have a bachelor's degree in engineering, chemistry, physics, biology, or mathematics, as well as an advanced degree or at least two years of work experience in the environmental field. The industrial hygiene and occupational safety 40-credit program is designed for practitioners with extensive experience who seek a professional credential; candidates may hold a master's or doctoral degree in engineering, chemistry, physics, quantitative or molecular biology, or a related field. Professionals from developing countries are particularly encouraged to apply. In addition to courses offered during the fall and spring semesters, relevant courses are offered during the Summer Session for Public Health Studies. Because entry into the 40-credit program is based on the applicant's ability to waive several required courses, students' programs are designed individually.

***Doctor of Science in Environmental Health***

Applicants to the doctoral program normally have a master's degree in environmental science or a related field and strong scientific and quantitative skills. Those applying to study in environmental science and risk management and in industrial hygiene and occupational safety normally have several years of relevant work experience in addition to a master's degree.

Students undertake a comprehensive program in their specialty area, as outlined in the descriptions above, and must fulfill course requirements for one major (20 credits) and two minor (10 credits each) fields. Admission into the doctoral program in all areas of interest depends upon demonstrated competence in the requirements for one of the SM programs described above. Doctoral candidates must pass the departmental written examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; complete, defend, and submit a thesis; and serve as a teaching assistant for the equivalent of three 5-credit courses. During the course of their program, most doctoral students also take advantage of opportunities to present papers at scientific conferences.

***Financial Support***

Depending on the specialty area, doctoral students may be funded either fully or partially through research fellowships or training grant fellowships. NIH traineeships are restricted to support for doctoral students who are U.S. citizens or permanent residents.

For students specializing in industrial hygiene and occupational safety, tuition support may be available through a NIOSH Education and Research Center Grant for highly qualified U.S. citizens or permanent residents. Support for these students may also be obtained through fellowship programs offered by the Department of Energy or by the Oak Ridge Institute for Science and Education.

***Occupational Health***

This concentration is designed to train occupational safety and health professionals to recognize and prevent occupational injuries and disease. Faculty members carry out research spanning a wide range of occupational health problems, with the broad objective of identifying and contributing to the reduction or elimination of job-related health hazards. Research topics include res-

piratory disease among exposed populations, including auto workers, textile workers, agricultural workers, workers exposed to fuel-oil ash, and building occupants; reproductive and chronic disease studies of populations exposed to petrochemicals and heavy metals; biological and chemical hazards assessment; epidemiology of acute injury and cumulative trauma disorders; occupational and environmental cancers, such as lung, skin, and bladder cancer; biomonitoring and medical surveillance; worker training; and occupational health research and training in developing countries. Faculty members have been in the forefront of the development of biochemical and molecular markers and their applications in epidemiologic studies of exposed populations.

Areas of interest include the following:

#### **Environmental Molecular Epidemiology**

This area of interest is for those students interested in the application of molecular methods to environmental epidemiologic studies for the measurement of exposure, disease susceptibility, or disease outcome. This area has a curriculum based in occupational and environmental health and augmented by the study of biomarkers, epidemiologic methods, physiology, cancer biology, exposure assessment, and molecular biology.

#### **Occupational Epidemiology**

Students interested in the epidemiology of occupational disease and injury may elect to pursue training in this area through a curriculum that includes courses in epidemiology, exposure assessment, occupational health, biostatistics, toxicology, and molecular biology. This area emphasizes the application of biomarkers to occupational health and statistical modeling of exposure-response relationships.

#### **Degree Programs in Occupational Health**

The training programs in occupational safety and health are offered through the NIOSH-sponsored Harvard Education and Research Center for Occupational Safety and Health.

Listed below, the following programs are offered: master of occupational health (MOH); master of science (SM) in primary health care nursing (from Simmons College) and dual-degree SM in environmental health and primary health care nursing (from HSPH, in cooperation with Simmons College); SM in environmental health with a focus on occupational safety and health; and doctor of science (SD) or doctor of public health (DPH).

#### **Master of Occupational Health**

The 40-credit master of occupational health (MOH) program is designed to train physicians in the public health disciplines relevant to the prevention and control of occupational disease and injury. Physicians interested in occupational and environmental medicine may apply either to the MOH program or to the occupational and environmental health concentration of the master of public health (MPH) program. Either the MOH or the MPH is taken as the first year of a two-year Occupational and Environmental Medicine Residency.

Core course requirements for the MOH (or the MPH) are as follows: BIO 200, *Principles of Biostatistics*; EH 243, *Ergonomics and Human Factors*, or EH 241, *Occupational Safety*; EH 262, *Introduction to the Work Environment*; EPI 200, *Principles of Epidemiology*; HSB 201, *Society and Health* (or alternate); CCE 204, *Principles of Toxicology*; EH 231, *Occupational Health Policy and Administration*; EH 232, *Introduction to Occupational and Environmental Medicine*; EHE 215, *Environmental and Occupational Epidemiology*; and ID 263, *Practice of Occupational Health*. Recommended electives include either BIO 210, *The Analysis of Rates and Proportions*, or BIO 211, *Regression and Analysis of Variance in Experimental Research*. MOH students may also choose to take ID 250, *Ethical Basis of the Practice of Public Health*, which is required by the MPH program. Also recommended is MIT course 10.805J, *Technology, Law, and the Working Environment*.

For more information about the occupational safety and health concentration, the MOH program, and training in occupational epidemiology, please contact David C. Christiani, MD, SM, MPH, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.

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Environmental molecular epidemiology area of interest

Karl T. Kelsey, MD, MOH

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#### **Related Offerings**

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 21.

MPH concentrations in occupational and environmental health and in quantitative methods, see page 48.

Occupational and Environmental Medicine Residency, see page 19.

### **Master of Science in Environmental Health**

The occupational safety and health concentration emphasizes the epidemiologic and biostatistical aspects of this field. The SM is normally an 80-credit program, although an individual with a PhD or JD may be admitted to a 40-credit program. It is generally expected that students without a prior doctoral degree will wish to enroll in a subsequent doctoral program.

Applicants normally have a bachelor's degree and advanced training in science, including college-level organic and inorganic chemistry. Those currently holding positions in the field of occupational safety and health and planning to return to these positions are considered particularly strong candidates for admission.

### **Master of Science in Primary Health Care Nursing (one-year program)**

This program is offered by the Harvard Education and Research Center for Occupational Safety and Health and Simmons College, which awards the degree. It is designed for registered nurses seeking preparation as occupational health nurse practitioners. Applicants must have at least a bachelor's

degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of basic statistics and physical assessment courses, and must be registered to practice nursing in a U.S. state or territory.

Participants undertake practica in industrial settings, clinics, and hospital-based occupational health programs and complete the following courses at Simmons College: NUR 404, *Normal and Abnormal Human Physiology*; NUR 406, 407, 408, *Research Methods I, II, III*; NUR 480, 482, *Theory and Practice: Primary Health Care Nursing I, II*; NUR 481, *Theoretical Foundations for Nursing Practice*; NUR 422, *Clinical Pharmacology for Nurses in Ambulatory Care*; NUR 485, 486, *Health in the Workplace I, II*; GSHS 900, *Introduction to Health Care Systems*; and NUR 470, *Health Promotion in Primary Care Nursing*. Students take EH 231, *Occupational Health Policy and Administration*, at HSPH.

### **Master of Science in Environmental Health (HSPH) and Primary Health Care Nursing (Simmons College) (dual-degree, two-year program)**

The dual-degree program focusing on occupational health nursing is also aimed at preparing nurses for positions as occupational health nurse practitioners. It emphasizes identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. The program integrates curricula from HSPH and Simmons College, with courses taken concurrently at both institutions.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of a basic statistics course, and must be registered to practice nursing in a U.S. state or territory. Nurses interested in this program must apply to, be accepted by, and maintain satisfactory academic progress in both schools.

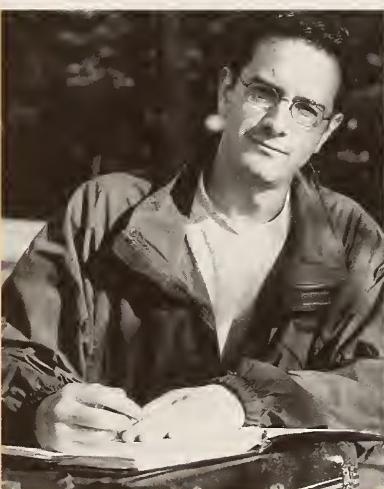
Students in the dual-degree program fulfill essentially the same course requirements at Simmons College as those enrolled in the 40-

#### **Michael McClean Doctor of Science Student**

Michael McClean, who received an SM focusing on industrial hygiene from HSPH in 1999, is a first-year doctoral student in the environmental science and engineering concentration. He is currently involved in a major study of highway workers in Massachusetts to try to determine whether there is a link between asphalt exposure and cancer risk.

McClean became interested in occupational health while working on his master's degree. Of his current project he says, "This is an issue that directly affects the health of these workers. It has been a great experience to monitor them over time, listen to their concerns, and maybe be able to help them."

Once he has his degree, McClean says he can see himself teaching at the college level or doing environmental consulting.



credit program. In addition, they must take the following HSPH courses: EH 243, *Ergonomics and Human Factors*; EH 262, *Introduction to the Work Environment*; EH 241, *Occupational Safety*; ID 263, *Practice of Occupational Health*; BIO 200, *Principles of Biostatistics*; EPI 200, *Principles of Epidemiology*; EHE 215, *Environmental and Occupational Epidemiology*; a tutorial in toxicology; and two electives. Students must also complete an independent study project.

#### **Doctor of Science in Environmental Health/Doctor of Public Health**

The SD or DPH degree may be earned by students who wish to concentrate in occupational health. Students may also wish to pursue additional training opportunities through the occupational epidemiology and/or environmental molecular epidemiology areas of interest described earlier. Students fulfill course requirements in one major (20 credits) and two minor fields (10 credits each). In addition, they must pass a written departmental comprehensive examination; pass the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis.

#### **Financial Support**

Some financial support may be available for U.S. citizens or permanent residents through National Research Service Awards, NIOSH or other traineeships, or scholarships.

#### **Physiology**

The concentration in physiology focuses on normal and pathological functions of organisms. It centers on the respiratory system because the system presents an immense, thin-surface area to the environment and is thus an important route of entry to the body as well as a site of damage from toxins and infections. Topics of study include mediators and adhesion molecules involved in inflammation; the effects of inhaled particles; lung infections; biomechanics of cells and tissue in normal and inflamed lungs; smooth muscle function in asthma; control of breathing; sleep-related breathing disorders; mecha-

nisms of dyspnea and respiratory sensations; cardiovascular pathobiology; and epithelial cell, macrophage, lymphocyte, and neutrophil lung biology. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

The physiology concentration integrates a range of scientific disciplines, including physics, bioengineering, physiology, biomathematics, cell biology, molecular biology, clinical science, and epidemiology. By working within this rich interdisciplinary environment, students learn many measurement technologies, discover a variety of disciplinary approaches, and develop mature scientific thinking. Special facilities are available, including a confocal microscope, analytical electron microscopes, a flow cytometer, a sleep laboratory, and a sensation laboratory.

#### **Degree Programs in Physiology**

As described below, the concentration in physiology leads to either the doctor of philosophy (PhD) degree, offered through the Division of Biological Sciences, or the doctor of science (SD) degree, offered through the Department of Environmental Health. Areas of interest in both programs include cell and molecular biology of the lungs, pathogenesis of lung disease, respiratory physiology, bioengineering, and infectious diseases.

Applicants to the PhD or SD programs generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants must take both the GRE general and subject tests by November in order to meet the PhD application deadline of December 15, 2000.

#### **Doctor of Philosophy in Biological Sciences in Public Health (Physiology)**

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health may apply to the PhD program offered by the Division

For more information about research and training in physiology, please contact Jeffrey J. Fredberg, SMME, ME, PhD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.

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E-mail: jfredber@hsp.harvard.edu

For application materials and information about admission to the PhD Program in Biological Sciences in Public Health (program 8500), please contact the Graduate School of Arts and Sciences Admissions Office, Harvard University, 8 Garden Street, Cambridge, MA 02138

Phone: 617-495-5315

Applicants who have specific questions about the PhD program may also contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-2932

Fax: 617-432-0433

E-mail: kenworthy@cylab.harvard.edu

Web: [www.hsp.harvard.edu/Academics/dbs/index.html](http://www.hsp.harvard.edu/Academics/dbs/index.html)

For more information about research and training in population genetics, please contact Xiping Xu, MD, PhD, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115. Phone: 617-432-2959 Fax: 617-432-2956 E-mail: xxu@hchp.harvard.edu

of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

The program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. It offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in this program engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

Graduates ordinarily assume positions as faculty members and research scientists at medical schools, research institutes, and schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.



### **Doctor of Science in Environmental Health**

Students wishing to study cellular, integrative, or engineering approaches as they pertain to problems in the environment, physiology, or public health may apply directly to the doctor of science (SD) program in the Department of Environmental Health. Like the PhD program, the SD program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics, and provides the opportunity for students to engage in laboratory rotations.

Students in the SD program must pass the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis based on intensive research under the guidance of a faculty adviser in the student's area of concentration.

### **Financial Support**

Most students admitted to the PhD and SD programs receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

### **Population Genetics**

The aim of the population genetics concentration is to consider the effects of genes, environmental risk factors, and the interaction of the two in the disease process for genetically complex diseases such as asthma, osteoporosis, diabetes, hypertension, reproductive health, drug addiction, and coronary heart disease.

Population genetics is a multidisciplinary field, combining various aspects of genetics, epidemiology, statistics, biology, medicine, and computer science. The concentration is intended to provide candidates with training in all critical areas needed to carry on independent research, including gene-mapping, to identify the loci and variants responsible for the genetic contribution to complex diseases; gene assessment, to investigate the role of a particular (candidate) gene in disease pathogenesis; analysis of gene-environmental interactions, to explore the relative contributions of genetic and environmental factors in disease manifestation; and mutation detection and allele frequency distribution, to assess the distribution of disease-predisposing factors in the population at large.

The Program for Population Genetics (PPG) is presently engaged in several large-scale studies of common, genetically complex human disease. In addition, PPG investigators collaborate closely on related studies in the Departments of Environmental Health and Epidemiology and the Channing Laboratory at Brigham and Women's Hospital. Students in the concentration are exposed to this work through course lectures, a weekly seminar, and interaction with faculty members.

#### Degree Programs in Population Genetics

No master's degree programs are offered. Students may concentrate in population genetics at the doctoral level only.

#### Doctor of Science in Environmental Health

In addition to the schoolwide requirements, doctoral students are required to take 30 credits emphasizing population genetics, including EPI 202, *Elements of Epidemiologic Research*; EPI 203, *Design of Case-Control and Cohort Studies*; EPI 204, *Analysis of Case-Control and Cohort Studies*; EPI 250, *Molecular Epidemiology of Cancer*; EPI 251, *Studies in Molecular Epidemiology*; EH 205, *Human Physiology*; EH 269, *Exposure Assessment for Environmental and Occupational Epidemiology*; EHE 215, *Environmental and Occupational Epidemiology*; EHB 277, *Modern Genetic Epidemiology and Gene-Mapping*; EHB 281, *The Genetic Basis of Human Disease*; and EPI 249, *Molecular Biology for Epidemiologists*. Students take an additional 10 credits from a list of electives.

#### Occupational and Environmental Medicine Residency

This residency emphasizes the development of skills in clinical occupational and environmental medicine and epidemiology. During this year acquired knowledge and abilities are applied to patient management and workplace community problem solving; at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital- and community-based occupational and environmental health clinics. Additional rotation choices are available in corporate medical departments and governmental agencies. The residency is fully accredited by the Accreditation Council for Graduate Medical Education.

Applicants must be graduates of an approved school of medicine and must have completed at least one year of internship training in a U.S. or Canadian clinical residency; board eligibility or certification in a primary care specialty is preferred. Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered strong candidates for admission. In addition to submitting an application to the degree program, prospective residents should send a letter of interest to the Occupational Health Program, enclosing a curriculum vitae listing medical training and experience, research experience, and publications. Admission to the practicum year of the residency is a separate process from, and usually occurs shortly after, admission to the degree program. Applicants who require early notification of admission to the residency program should send a cover letter to this effect with their application. Applicants to the MOH program and the MPH program with a concentration in occupational and environmental health who are also applying to the Occupational and Environmental Medicine Residency must apply by September 1, 2000, for 2001-02 matriculation. Continuation into the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the didactic phase of the program.

#### Financial Support

Some financial support for residency candidates who are U.S. citizens or permanent residents may be available through traineeships or National Research Service Awards.

#### Financial Support

Some financial support may be available to U.S. citizens and permanent residents.

For more information about the Occupational and Environmental Medicine Residency, please contact Howard Hu, MD, SM, SD, Department of Environmental Health, 655 Huntington Avenue, Boston, MA 02115.

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## Department of Epidemiology

*Epidemiology—the study of the frequency, distribution, and determinants of disease in humans—is one of the fundamental sciences of public health. While individual epidemiologists have different study objectives and use many approaches, the aims of epidemiologic research ultimately lie in the prevention or effective control of human disease.*

The Department of Epidemiology has a long tradition of teaching and research in the epidemiology of cancer, cardiovascular disease, and other chronic diseases, as well as in epidemiologic methodology. Current research in the department includes the role of viruses in the etiology of cancer; the connection between diet and risk of cancer, cardiovascular disease, and other major chronic diseases; the relationship between exposure to chemicals in the workplace and the development of cancer; the epidemiology of infectious disease; factors in early life predisposing individuals to chronic diseases; case identification and risk factors in mental disorders; health effects of drugs, vaccines, and medical devices; and causes of human infertility.

Students in the Department of Epidemiology choose from among thirteen areas of interest:

### Cancer Epidemiology

In addition to research methodology, the curriculum in this area includes courses on the biology and genetics of cancer; the basic concepts and issues of cancer epidemiology; the roles of diet, oncogenic viruses, and occupational exposures in the etiology of cancer; the integration of biomarkers into research; the prevention of cancer; and research methods. Research opportunities for students include a large number of ongoing cohort and case-control studies within the department and in conjunction with the Dana-Farber/Harvard Comprehensive Cancer Center.

### Cancer Prevention

This area provides students with knowledge of the science of cancer prevention, expertise in a specialized research area, skill in policy analysis, and an introduction to professional networks through which they will be able to update continuously their knowledge of this evolving field. Social and behavioral scientists enrolled in the program prepare themselves to advance knowledge of the efficiency and effectiveness of alternative strategies for inducing behavioral change at the individual, institutional, community, or policy levels. Physicians prepare themselves for careers as clinical investigators or public health practitioners specializing in cancer prevention. The program combines the interdisciplinary resources of the Harvard Center for Cancer Prevention and of the Division of Cancer Epidemiology and Control in the Dana-Farber Cancer Institute.

## **Cardiovascular Epidemiology**

This area provides training in research methodology and the epidemiology of cardiovascular diseases. Doctoral students conduct research in a substantive or methodological sphere related to cardiovascular epidemiology.

## **Clinical Epidemiology**

This area is designed primarily for clinicians and other health care professionals who wish to develop the quantitative and analytic skills needed for clinical research. Students take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics such as health status and quality-of-life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

While the appropriate content for this area may be covered by taking courses offered during the regular academic year (fall and spring semesters), requirements for the 40-credit master of science (SM) degree in epidemiology, described later, may also be partially fulfilled by taking the summer courses offered through the Summer Program in Clinical Effectiveness. Students begin their program by taking a core set of clinical effectiveness courses during an initial summer period. They complete the SM program by taking advanced courses during the regular academic year and, if desired, during a second summer period. Alternatively clinical effectiveness students who only take courses during two summer periods can satisfy the requirements for the SM degree by completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manuscript of quality suitable for publication. An outline for this project must be submitted at the time of application.

## **Environmental/Occupational Epidemiology**

This area is closely associated with the concentrations in environmental epidemiology and occupational health in the Department of Environmental Health. Students take courses in epidemiology, environmental health, occupational health, biostatistics, and toxicology. Doctoral students conduct research in a substantive or methodologic domain related to environmental or occupational health.

## **Epidemiologic Methods**

This area provides training in the development and application of new methods in epidemiologic research. Through courses offered by the Department of Epidemiology, students learn to use and justify classical epidemiologic methods in study design, data analysis, and interpretation of results. Through courses offered by the Department of Biostatistics, students receive training in biostatistical areas most relevant to epidemiologic research. Through advanced course work and tutorials, students are introduced to recent innovations in epidemiologic methodology. Doctoral students conduct research with faculty members specializing in the development of new methodologies and in novel applications of existing methodologies to important data sets in epidemiology. Students enrolling in this area of interest ordinarily have completed four semesters of college calculus and one semester of linear algebra.

## **Infectious Diseases**

This area is designed to familiarize students with the epidemiology and biology necessary to understand the interactions of infectious agents, their hosts, and their vectors. Social and cultural aspects of infectious diseases and of related health services are covered, as are new and resurgent infectious diseases. Students in this area take courses in the Departments of Epidemiology, Immunology and Infectious Diseases, and Population and International Health. More advanced topics of infectious disease epidemiology are covered in tutorials with faculty members focusing on this area.

For more information about the Department of Epidemiology, visit its Web site: [epinet.harvard.edu/](http://epinet.harvard.edu/)

For more information about research and training in cancer epidemiology, please contact Nancy E. Mueller, SD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115. Phone: 617-432-4576 Fax: 617-566-7805 E-mail: [nmueller@hsph.harvard.edu](mailto:nmueller@hsph.harvard.edu)

For more information about research and training in cancer prevention, please contact Graham A. Colditz, MB, BS, DPH, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115. Phone: 617-525-2754 Fax: 617-525-2008 E-mail: [graham.colditz@channing.harvard.edu](mailto:graham.colditz@channing.harvard.edu)

For more information about research and training in cardiovascular epidemiology, please contact Eric B. Rimm, SD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115. Phone: 617-432-1843 Fax: 617-432-2435 E-mail: [eric.rimm@channing.harvard.edu](mailto:eric.rimm@channing.harvard.edu)

For more information about epidemiology research traineeships in cardiovascular disease or aging, please contact Julie E. Buring, SD, 900 Commonwealth Avenue East, Boston, MA 02215. Phone: 617-732-4965

For more information about research and training in clinical epidemiology, please contact E. Francis Cook, SD, Section on Clinical Epidemiology, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115. Phone: 617-732-5650 E-mail: [fran@clinepi.bwh.harvard.edu](mailto:fran@clinepi.bwh.harvard.edu)

**For more information about research and training in environmental/occupational epidemiology, please contact David C. Christiani, MD, SM, MPH, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-1260  
**Fax:** 617-432-0219  
**E-mail:** dchris@hoph.harvard.edu

**For more information about research and training in epidemiologic methods, please contact James M. Robins, MD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-0206  
**Fax:** 617-566-7805  
**E-mail:** robins@hspf.harvard.edu

**For more information about programs or courses relating to infectious diseases, please contact George R. Seage, MPH, SD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-4567  
**Fax:** 617-566-7805  
**E-mail:** gseage@hspf.harvard.edu

**For more information about research and training in molecular/genetic epidemiology, please contact David J. Hunter, MB, BS, SD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-525-2755  
**Fax:** 617-525-2718  
**E-mail:** david.hunter@channing.harvard.edu

**For more information about research and training in nutritional epidemiology, please contact Walter C. Willett, MD, MPH, DPH, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-4680  
**Fax:** 617-432-2435

### Molecular/Genetic Epidemiology

This area introduces students to the application of molecular and genetic methods in epidemiologic studies. These methods may be useful as measures of exposure, disease susceptibility, or disease outcome. Specific areas of training include family-based association methods, gene-mapping to identify the chromosomal localization of genes associated with disease, and fine mapping and identification of these genes. Drawing on information about genes already identified, population-based studies are used to correlate variation in genes with disease risk and prognosis and to assess gene-environment interactions. Relevant courses explore the genetic epidemiology of complex diseases, including cancer, cardiovascular disease, diabetes, psychiatric illnesses, Alzheimer's disease, and asthma, as well as individual variation in drug response (pharmacogenomics). Research opportunities exist within the department and through collaborations with the Department of Environmental Health (including the Program for Population Genetics), the Channing Laboratory, Dana-Farber Cancer Center, and others.

### Nutritional Epidemiology

This area is designed for students interested in the methodology related to nutritional assessment and in the nutritional determinants of disease. Through courses offered by the Departments of Epidemiology and Nutrition, students learn methods of nutritional assessment and their related strengths and weaknesses. Students also receive advanced training in methods for analysis specific to research in nutritional epidemiology. Students have the opportunity to conduct research within several large prospective ongoing studies at HSPH and Harvard Medical School, including an examination of dietary factors in relation to cardiovascular disease, cancer, and other chronic diseases; a study of the interactions between nutritional and genetic determinants of disease; and the assessment of nutritional supplementation in relation to infectious agents and malnutrition.

### Oral and Dental Health Epidemiology

This area prepares dentists and others interested in oral diseases for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. A new area of emphasis is the links among oral conditions, nutrition, and systemic diseases such as coronary heart disease, stroke, and cancer. Students follow the required curriculum in epidemiology with additional course work in oral biology and the epidemiology of oral and dental diseases. Students also participate in field research activities; case-control studies of oral health risk factors; or clinical trials designed to test preventive, diagnostic, or therapeutic interventions. This area of interest is jointly administered by the Department of Oral Health Policy and Epidemiology in the Harvard School of Dental Medicine and the HSPH Department of Epidemiology.

### Pharmacoepidemiology

This area is designed for those interested in studying the frequency and determinants of both unintended and expected effects of drugs and medical devices. Studies of the pattern of utilization of drugs and devices, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention represent important secondary themes. The Department of Epidemiology offers an intermediate-level course in pharmacoepidemiology and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and vaccine development. Students in pharmacoepidemiology have the opportunity to attend courses and congresses outside the school and are encouraged to undertake internships of up to three months in pharmaceutical firms or regulatory agencies. Students ordinarily have a prior degree in medicine or pharmacy. Others are expected to acquire substantially equivalent expertise in fields related to their research.

## Psychiatric Epidemiology

This area introduces students to concepts and methods for studying the genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses, as well as related courses offered in the Departments of Epidemiology, Biostatistics, Maternal and Child Health, and Health and Social Behavior.

## Reproductive Epidemiology

In addition to unique methodological issues, this area encompasses clinical, environmental, cancer, and infectious disease epidemiology. Reproductive epidemiologists choose as their interest the broad topic of the determinants and consequences of reproduction, including women's health and male infertility. Students can explore menarche, the menstrual cycle, infertility, conception, and pregnancy as endpoints in themselves or as factors influencing disease processes later in life.

There are a number of resources available to students who select this area. The Obstetrics and Gynecology Epidemiology Center, a research unit based at Brigham and Women's Hospital, offers selected students the opportunity to gain experience in day-to-day management, data collection, and analysis of large-scale population- and clinical-based epidemiological studies. Students interested in occupational/environmental and genetic reproductive epidemiology may pursue projects within the Reproductive Epidemiologic Working Group, consisting of faculty members from HSPH and other major public health institutions around the world. Students may also collaborate with other faculty members at HSPH, Harvard Medical School, and the Harvard-affiliated hospitals. Students will be encouraged and given guidance on how to submit their own research proposals for private or federal funding.



**Uwe Siebert**

**Master of Science Student**

A Brazilian native living in Germany, Uwe Siebert is a physician who has worked in primary health care projects in Benin, West Africa, and Brazil. He is a researcher and instructor in epidemiological methods and decision analysis at the Munich School of Public Health and a member of the German Health Technology Assessment Panel.

In the summer of 1997, Siebert attended a summer session at HSPH, where he studied decision analysis in clinical research with Professor Milton Weinstein.

Since that summer, he has dedicated his scientific work to the link between epidemiological methods and decision sciences. In 1998 Siebert came back to HSPH as a teaching assistant in Weinstein's summer course. He returned again in 1999 as a visiting scientist to improve his knowledge and experience in pharmacoepidemiology and pharmacoeconomics.

"One of the aspects of HSPH I enjoy most is the contact with international researchers and their different cultural views of health problems and solutions," he says. "This keeps my mind open."

## Degree Programs in Epidemiology

The department offers both 80-credit and 40-credit master of science (SM) programs, as well as a doctor of science (SD) and doctor of public health (DPH) program. Recent graduates have become members of the faculties of major universities, medical schools, and research institutes. They also serve as epidemiologists for the National Cancer Institute, Centers for Disease Control and Prevention, other domestic and international governmental institutions, and private industry.

### **Master of Science in Epidemiology (80-credit program)**

The master's programs provide students with basic skills in epidemiologic and quantitative methods and in computing, in preparation for research or academic careers. The 80-credit SM program is designed for individuals who hold a bachelor's degree and have a strong background in biology and mathematics. In addition to epidemiology and statistics courses, students study the basic medical sci-

For more information about research and training in oral and dental health epidemiology, please contact Chester W. Douglass, DMD, PhD, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston, MA 02115.  
Phone: 617-432-1456  
Fax: 617-432-0047  
E-mail: cdoug@warren.med.harvard.edu

For more information about research and training in pharmacoepidemiology, please contact Kin-Wei Arnold Chan, MD, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115.  
Phone: 617-432-4963  
Fax: 617-566-7805  
E-mail: kachan@hspf.harvard.edu

For more information about research and training in psychiatric epidemiology, please contact Stephen L. Buka, SD, Department of Maternal and Child Health, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-3870

Fax: 617-432-3755

E-mail: [sbuka@hsph.harvard.edu](mailto:sbuka@hsph.harvard.edu)

For more information about programs or courses relating to reproductive epidemiology, please contact Bernard L. Harlow, PhD, Obstetrics and Gynecology Center, 221 Longwood Avenue, RF 366, Boston, MA 02115.

Phone: 617-732-4897

Fax: 617-732-4899

E-mail: [bharlow@rics.bwh.harvard.edu](mailto:bharlow@rics.bwh.harvard.edu)

#### **Related Offerings**

**Interdisciplinary Program in Molecular Epidemiology, see page 50.**

**Program in the Epidemiology of Infectious Disease, see page 50.**

**Summer Program in Clinical Effectiveness, see page 53.**

**Women, gender, and health course offerings, see page 50.**



ences and the biological aspects of public health problems. The program is primarily intended for students who expect to continue toward a doctoral degree.

Required courses include EPI 201, *Introduction to Epidemiology*; EPI 202, *Elements of Epidemiologic Research*; EPI 203, *Design of Case-Control and Cohort Studies*; EPI 204, *Analysis of Case-Control and Cohort Studies*; BIO 201, *Introduction to Statistical Methods*; and BIO 210, *The Analysis of Rates and Proportions*. Recommended courses include EH 205, *Human Physiology*; BIO 211, *Regression and Analysis of Variance in Experimental Research*; BIO 213, *Applied Regression for Clinical Research*; CCB 210, *Introduction to Cancer Biology*; CCE 204, *Principles of Toxicology*; DBE 208, *Pathophysiology of Human Disease*; and ID 265, *Practice of Quantitative Methods*.

#### **Master of Science in Epidemiology (40-credit program)**

In preparation for research or academic careers, the 40-credit SM provides students with basic skills in epidemiologic and quantitative methods and in computing. Required courses are the same as for the 80-credit program. The remaining courses reflect areas of special interest and may include supervised research. The 40-credit program is open to applicants with a medical degree or master's level background in biology.

#### **Doctor of Science in Epidemiology/ Doctor of Public Health**

The doctoral programs are designed for students who plan careers in epidemiologic research or teaching or for those who aspire to leadership roles in the health professions. Applicants to the SD program should hold at least a bachelor's degree and have a strong background in biology and mathematics. For these individuals the degree generally takes four to five years to complete; candidates with relevant doctoral degrees may complete the program in three years. The DPH degree is available to students holding a prior doctorate and an MPH degree.

Course requirements are the same as for the SM program, with the addition of EPI 205, *Practice of Epidemiology*; EPI 207, *Advanced Epidemiologic Methods*; EPI 227, *Principles of Screening*; and for nonphysicians, EH 205, *Human Physiology*, and DBE 208, *Pathophysiology of Human Disease*. In addition, 10 credits are required in substantive courses offered by the department, 10 credits in biostatistics above the level of BIO 200, and 10 credits in a second minor field.

Unless courses equivalent to those described for the master's program have been taken previously, most of the first two years is devoted to course work. Subsequently doctoral candidates must pass the departmental written examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; complete, defend, and submit a thesis; and gain experience in teaching and research.

#### **Financial Support**

Funding may be available for U.S. citizens or permanent residents enrolled in the doctoral program or a postdoctoral fellowship program; depending on the specialty area, funding sources include the National Cancer Institute and the National Institute of Mental Health. For U.S. citizens and permanent residents interested in cardiovascular disease or aging, research traineeships may be available through Harvard Medical School.



**The mission of the Department of Health and Social Behavior is to identify the social and behavioral determinants of health and to develop and evaluate interventions and policies leading to the improvement of the public's health and quality of life. The department accomplishes this aim by integrating knowledge and methods from the social sciences with traditional core sciences of public health.**

## Department of Health & Social Behavior

**T**he department's educational mission is to train both scholars and practitioners: scholars whose research will illuminate basic social determinants of health and who will identify and test innovative social interventions; practitioners who are skilled in designing, implementing, and evaluating health-enhancing interventions in action settings and who appreciate the social ecology of health behavior as well as social and policy leverage points.

The department is divided into three areas of interest (described below) to identify social conditions and behaviors determining health, develop social and behavioral interventions, and understand the ways in which social and economic policies influence population health.

### Health and Social Policy

A wide range of social policies—including but not limited to labor, poverty, family, housing, and educational policy—have a dramatic impact on health. This area of interest prepares students to design new and improve existing social policies and teaches strategies for the successful implementation of these policies. Students who study in this area may be interested in working on public policy through research, within the government, or in a nonprofit organization.

### Planned Social Change

This area of interest focuses on the application of theory in the design of intervention programs, as well as on research and evaluation methodology. The area includes work on interventions using randomized clinical trial designs, as well as quasi-experimental approaches. Attention is given to the following design steps: problem diagnosis, assessment, formative research, program design, and evaluation. The social settings for interventions may be communities, workplaces, schools and colleges, and health care facilities. Populations of interest include those who are underserved, marginalized, and in special need. Intervention strategies encompass community organizing and improvement, social marketing, communication, adult learning approaches, and advocacy.



**Bernardo Hernandez**  
Director of Epidemiology  
Center for Population Research,  
National Institute of Public Health, Mexico

After receiving his SD from the Department of Health and Social Behavior at HSPH in 1998, Bernardo Hernandez returned to the National Institute of Public Health in Cuernavaca, Mexico, where he had worked in the late 1980s. As director of epidemiology at the institute's Center for Population Research, Hernandez coordinates research projects relating to the epidemiology of

chronic disease. He is personally involved in a project relating to obesity, an effort to promote healthy lifestyles among adolescents, and is researching factors related to maternal mortality and reproductive health. Hernandez also coordinates the institute's master of science in reproductive health program and teaches subjects ranging from methods of research to epidemiology and statistics.

Hernandez says he chose HSPH because of faculty involvement in health intervention, which is one of his primary interests. Majoring in health and social behavior, he acquired the tools necessary to design, implement, and evaluate health interventions and has been able to apply them to his current work.

For more information about research and training in health and social behavior, please contact Michele Brooks, academic coordinator, Department of Health and Social Behavior, 677 Huntington Avenue, Boston, MA 02115. Phone: 617-432-3775 Fax: 617-432-3123 E-mail: [mbrooks@hsph.harvard.edu](mailto:mbrooks@hsph.harvard.edu)

### Social Determinants of Health

This area of interest focuses on analysis of the major social conditions that affect the health of populations. Research emphasizes socioeconomic position, social and economic inequality, discrimination, social networks and support, social capital, work conditions, and psychological states. Seminars, tutorials, and courses enable students to explore a range of health consequences of various social factors by studying varied subgroups, at different times and places and under diverse and changing conditions. Students examine mechanisms and processes through which social factors exert their impact, and also investigate mechanisms that mediate or moderate relationships between social factors and health outcomes.

### Degree Programs in Health and Social Behavior

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, as well as a program leading to the doctor of science (SD) degree.

All students in the Department of Health and Social Behavior are required to take (at a minimum) the schoolwide requirements in biostatistics and epidemiology; students in SM programs must also fulfill core requirements in environmental health and public policy. In addition, the department requires two core courses: HMP 200, *Social and Behavioral Dimensions of Public Health*, and HSB 201, *Society and Health*. Beyond these core requirements, students may wish to concentrate their work on one of the three areas of interest just described.

#### ***Master of Science in Health and Social Behavior (80-credit program)***

The 80-credit master's program prepares students for work in a variety of community, public, and private settings with a focus on program design, public policy supervision, and evaluation; and for work as members of research teams.

Students enter the 80-credit program with a background (often a major) in the social/behavioral sciences and experience in the field. This degree does not require previous graduate work.

Of the 80 credits necessary to earn this degree, at least 20 must be earned in departmental courses. After fulfilling the core requirements, students are encouraged to delineate professional goals and to develop an area of expertise. They often focus on a subject area (such as AIDS, addiction, cardiovascular risk reduction, cancer, environmental health, health education, the health of families, labor and workplace issues, literacy, and women's health) and/or a skill area (such as program design, program evaluation, communication, public policy, marketing). Master's students are encouraged to

declare an area of interest within the Department of Health and Social Behavior and to complete an internship as part of their training.

#### ***Master of Science in Health and Social Behavior (40-credit program)***

The 40-credit master's program also prepares students for work in a variety of community, public, and private settings with an emphasis on program design, supervision, and evaluation; and for work as members of research teams. One recent graduate is serving as the evaluator on a violence prevention program for adolescents; another works with a non-profit organization coordinating international efforts related to women's health.

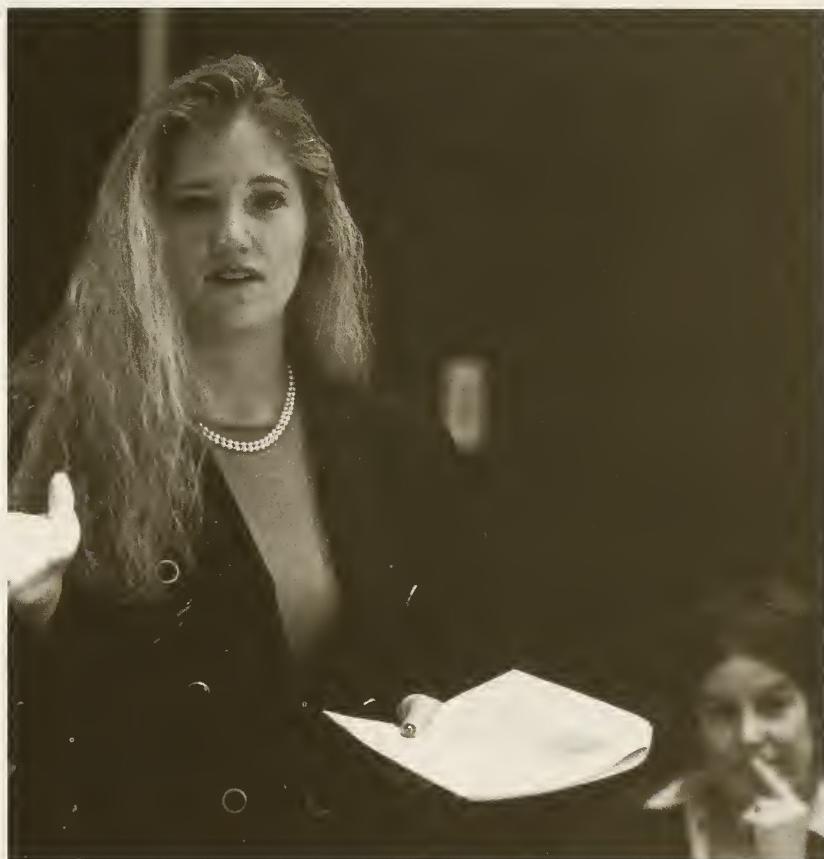
Students enter this program with a related graduate degree and with experience in the social/behavioral sciences or a public health field.

Of the 40 credits necessary to earn this degree, at least 15 must be earned in departmental courses. After fulfilling core requirements, students are encouraged to focus their work in a specific content or skill area. They should work closely with their advisers to develop a study plan early in the fall semester.

#### ***Doctor of Science in Health and Social Behavior***

The doctoral programs train students as scholars and researchers who will identify new social and behavioral risks, work in health and social policy, and test innovative social interventions; or as practitioners who will design, implement, and evaluate health-enhancing interventions or public policies. Recent graduates are working in research and academic settings.

Doctoral programs are offered in three areas of interest: social determinants of health, planned social change, and health and social policy. Most students enter the doctoral programs with a strong foundation in the social and behavioral sciences and with an earned master's degree. The department accepts a small number of students without a master's degree directly into the doctoral program.



Requirements for doctoral students include area-specific course work in theory and methods; students should consult the department's doctoral handbook for a listing of required courses in each of the areas of interest. Doctoral candidates must pass the departmental written examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, submit, and defend a thesis based on original research.

#### ***Related Offerings***

**MPH concentration in family and community health, see page 47.**

**Women, gender, and health course offerings, see page 50.**

#### ***Financial Support***

Limited funding is awarded on a competitive basis to qualified applicants. For U.S. citizens and permanent residents, a fellowship is available in the area of cancer prevention, and some fellowships may also be available for underrepresented minorities.



*The Department of Health Policy and Management is a mission-oriented department concerned with improving the health care delivery system and mitigating public health risks in the United States and abroad. The department is dedicated to resolving major management and health policy problems through original research, advanced training, and dispute resolution.*

## **Department of Health Policy & Management**

**R**esearch priorities in the Department of Health Policy and Management are organized into eight broad areas: health financing and insurance, including the creation of new physician payment systems and the design of public policies dealing with rising insurance premiums; management of health hazards—for example, by using risk assessment to set priorities for environmental health protection; management of health care organizations, including the application of corporate strategic planning concepts to the challenges faced by health systems and pharmaceutical firms; management and evaluation of medical technology, including the meta-analysis of data from clinical trials; business and labor in health, including the negotiation of occupational safety and health care benefits in the collective bargaining process; international health, including evaluation of the cost-effectiveness of health programs in developing countries; quality of health care, including the design of better methods to measure quality; and health care reform, which includes the development of partnerships between the department and the corporate community to explore critical aspects of health policy and management.

The department's problem-solving orientation is exemplified by its strong ties to leading health practitioners in hospitals, HMOs, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical problem-solving skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

## Degree Programs in Health Policy and Management

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a nonresidential, part-time master of science in health care management for physicians, and a doctor of science (SD) program. The department also participates in the universitywide doctor of philosophy (PhD) Program in Health Policy.

The department has developed an effective job placement mechanism for its graduates that offers numerous contacts with potential employers on a national scale. Practitioners are invited to the department to discuss their work and career paths, and a system of faculty networking and professional contacts is used to link students with a broad range of health policymakers and executives.

### *Master of Science in Health Policy and Management (80-credit program)*

The 80-credit SM program is designed for students who are building professional careers in health-related fields and who aspire to leadership roles in the public or private sector. The program emphasizes professional skills and concepts, a solid grounding in the substance of health problems, rigorous quantitative training, and a curriculum that combines professional, academic, and clinical activities. Acquired knowledge is applied to practical situations through a required summer internship program and an applied field research project.

Recent graduates have taken such positions as research analyst for Mathematica Policy Research and Alkermes, Inc.; program assistant for health at the Commonwealth Fund; analyst at Covance, Inc.; consultant with Deloitte & Touche LLP; and positions with Blue Cross/ Blue Shield, Decision Resources, Roxbury Comprehensive Community Health Center, and Kaiser Permanente. Others have gone on to doctoral and fellowship programs.

Applicants come from a wide variety of undergraduate fields. They are expected to have work experience and an academic record, particularly in quantitative and analytical courses, that suggest outstanding

potential in the areas of health policy and management. Applicants should have at least two years of relevant postbaccalaureate work experience in the health field; exceptions are occasionally made for outstanding candidates. Deferred admission is available for applicants who demonstrate strong potential but who need to gain more professional experience in the health sector.

Of the 80 credits necessary to earn the SM, required courses account for 30 to 35. All students take courses in epidemiology, statistics, environmental health, health and social behavior, economics, and health policy and management. In addition, students must satisfy the requirements of at least one of the three areas of interest described below. A guide, available from the department, describes these requirements. After the required credits have been completed, students are encouraged to enroll in relevant courses at other Harvard schools.

**Management.** This area of interest is designed for students pursuing management careers in public- or private-sector health institutions. Required and elective course work gives students a range of managerial skills, including marketing, managed care, financial analysis, cost accounting, budgeting, strategic planning, information systems, operations management, and organizational behavior.

**Policy.** This area of interest is designed for students who wish to become involved in the formulation of health policy, including such areas as medical care policy at local, state, and national levels; health finance and insurance; access to health care; payment to institutions and practitioners; political analysis and strategy; medicaid and medicare reform; injury control; mental health; and substance abuse. In addition to required courses, the variety of recommended electives permits students to acquire additional skills in areas such as epidemiology, quantitative policy analysis, and health law.

**Research.** This area of interest is designed for students looking toward doctoral education and research careers in fields such as health economics, quality of care, technology

For more information about SM and SD programs in health policy and management, as well as postdoctoral fellowships, please contact the deputy director of academic programs, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4511

Fax: 617-432-4494

Web: [www.hsp.harvard.edu/hpm](http://www.hsp.harvard.edu/hpm)

For more information about the master of science degree in health care management, please contact Sharon O'Brien, program administrator, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4324

E-mail: smobrien@hsph.harvard.edu

Web: [www.hsph.harvard.edu/mhcm](http://www.hsph.harvard.edu/mhcm)

For more information about the PhD program, including financial aid, please contact Joan P. Curhan, director, PhD Program in Health Policy, 79 John F. Kennedy Street, Cambridge, MA 02138.

Phone: 617-496-5412

Fax: 617-496-9053

E-mail: [Joan\\_Curhan@harvard.edu](mailto:Joan_Curhan@harvard.edu)

Web: <http://www.fas.harvard.edu/~healthpl>

For application materials for the PhD program, please contact the Graduate School of Arts and Sciences, 8 Garden Street, Cambridge, MA 02138

Phone: 617-495-5315

Web: [www.gasas.harvard.edu/admissions](http://www.gasas.harvard.edu/admissions)

assessment, health decision analysis, cost-effectiveness analysis, cost-benefit analysis, and advanced statistical analysis. Students are required to take courses in decision analysis, cost-effectiveness and cost-benefit analysis, and advanced biostatistics.

#### ***Master of Science in Health Policy and Management (40-credit program)***

The 40-credit SM program is designed for students pursuing research careers in public- or private-sector health care institutions, particularly physicians and other candidates with relevant advanced degrees who desire intensive training in analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions. Recent graduates have taken positions at academic medical centers and other health care organizations.

Applicants should hold graduate medical or other professional degrees and have significant experience in health services. They typically expect to devote a substantial portion of their careers to research, particularly in areas such as health services research, cost-effectiveness analysis, and clinical decision making.

Required courses for the degree include BIO 200 or 201, introductory biostatistics, or BIO 206, *Introductory Statistics for Medical Research*; EPI 200 or 201, introductory epidemiology, or EPI 208, *Introduction to Clinical Epidemiology*; up to 10 tutorial credits; and an additional 10 credits in courses within the department. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health services research, health decision sciences, quality improvement, technology assessment, and program evaluation.

#### ***Nonresidential, Part-time Master of Science in Health Care Management for Physicians***

This 40-credit, two-year, part-time degree program trains clinicians in the executive skills required for management. The program includes course work on strategy determination, financial analysis, negotiation, organizational behavior, operations management,

information systems, and quality-of-care management. This program is intended for midcareer MDs with significant management responsibilities who wish to be more effective in their roles in the health care sector.

Degree candidates are required to spend three weeks each summer on campus, as well as five four-day weekends (Friday–Monday) each academic year. Scheduled teleconferences, an estimated ten to fifteen hours per week of assignments, and a final practicum are also required.

This is a closed-cohort learning situation. Attendance at all sessions is mandatory, and previous courses and/or degrees will not be applied to degree requirements. No auditing or cross-registration is allowed.

#### ***Doctor of Philosophy in Health Policy***

The PhD in health policy, awarded by the Faculty of Arts and Sciences, is designed for students seeking teaching careers in institutions of higher learning (schools of public health, public policy, and medicine) and/or research careers in health policy. It is a collaborative program of five Harvard University faculties: the Graduate School of Arts and Sciences, the School of Public Health, Harvard Medical School, the Kennedy School of Government, and Harvard Business School. Because this is an interfaculty program, enrolled students take courses throughout the university.

Students select one of the following six concentrations: decision science, economics, ethics, management, political analysis, or statistics and evaluative science. In addition, at the thesis stage, students specialize in one of four policy areas: environmental health, health care services, mental health, or public health.

Applicants must take the GRE or GMAT, and those whose native language is not English must take the TOEFL.

HSPH forms cannot be used to apply for this program. All potential students must obtain their application materials from the Graduate School of Arts and Sciences at 8 Garden Street, Cambridge, MA 02138.

### **Doctor of Science in Health Policy and Management**

The SD program in health policy and management is designed for physicians and lawyers who are interested in doctoral-level research training in health policy and who are committed to applied, interdisciplinary research. The program prepares graduates to perform research in the academic or professional realm.

Candidates complete a set of required courses in epidemiology, biostatistics, decision sciences, economics, program evaluation, health politics, and public health law (lawyers only). In addition, each student works closely with a faculty adviser to develop an individual plan of study. While students in this program have the opportunity to take courses throughout the university, all required courses are offered through HSPH. Candidates normally complete two academic years of study in residence at HSPH; pass a written departmental general examination and an oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis for publication. The doctoral thesis, advised by a faculty committee of three or more members, is normally comprised of three publishable papers.

Applicants must hold an MD, a JD, or other terminal professional degree. Moreover, applicants should have a strong aptitude in a quantitative discipline (demonstrated by prior academic performance, work experience, and standardized test scores from the GRE, MCAT, or LSAT), experience in the health sector, and the ability to perform original and independent work. Applicants should indicate their anticipated area of interest within the department and anticipated faculty mentor (if known) in their application essay.

### **Financial Support**

The Department of Health Policy and Management offers two-year postdoctoral fellowships to physicians, dentists, and nurses who have earned a PhD and who wish to do inde-

pendent research in such areas as quality of medical care, technology assessment and cost-effectiveness, health care policy, management of health care organizations, and AIDS policy. The program emphasizes methodology in evaluation research, decision science, economics, and organizational analysis and permits fellows to design individualized programs of study. Fellows may also apply for admission to a formal degree program.

Candidates must hold an MD, a DDS, or an equivalent degree and must be U.S. citizens or permanent residents. Applicants must submit a curriculum vitae, three letters of reference, and a statement describing career goals, research interests, and reasons for applying. The application deadline is November 15, 2000, for a fellowship beginning in July 2001.



**Kate Willrich**

**Director of Program Development,  
Massachusetts Division of Medical  
Assistance**

As director of program development for the Massachusetts Division of Medical Assistance, the agency that administers medicaid for the state, Kate Willrich helps design and implement new health programs for low-income residents. She has worked closely with the federal government, advocates, providers, and other agency staff members to design a program to integrate services and funding for seniors eligible for medicare and medicaid. She has also been involved in

efforts to improve the availability of services for special populations, such as children with autism spectrum disorder, and oversees a project to integrate funding for children with severe emotional disturbances. In addition, Willrich has helped to implement a catastrophic pharmacy program for seniors and people with disabilities ineligible for medicaid.

Willrich received an SM in health policy and management from HSPH in 1994. She was attracted to the program, she says, because she wanted to augment her skills in quantitative analysis and methods for policy analysis, as well as gain formal training in health policy and management.

### **Related Offerings**

**Environmental science and risk management area of interest, Departments of Environmental Health and Health Policy and Management, see page 12.**

**MPH concentrations in health care management and in law and public health, see page 47.**



*The Department of Immunology and Infectious Diseases focuses on the biological, immunological, epidemiological, and ecological aspects of viral, bacterial, protozoan, and helminthic diseases of animals and humans and the vectors that transmit some of these infectious agents.*

## Department of Immunology & Infectious Diseases

**R**esearch in the department emphasizes basic pathogenic mechanisms that may lead to better diagnostic tools, the development of vaccines and other immune interventions for prevention and control of infection and disease, and the identification of new targets for antiviral and antiparasite drugs. Laboratory-based research within the school may be supplemented by field-based studies of epidemiological and ecological aspects of infectious disease transmission and control. Diseases of developing countries are emphasized.

Members of the department take a multidisciplinary approach that includes immunology, molecular biology, public health entomology, cell biology and ultrastructure, biochemistry, pathology, virology, epidemiology, and ecology. They undertake research both within the school and around the world.

Infectious disease vectors currently under study include protozoa (malaria, leishmania, ameba, giardia), helminths (schistosomes, filaria, onchocerca), viruses (HIVs, leukemia retroviruses, eastern equine encephalitis), and bacteria (Lyme disease agents, ehrlichia, tuberculosis). Further immunologic studies focus on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, the function and regulation of T-cell-derived cytokines, and cytokines involved in the regulation of inflammation.

Students in the various degree programs choose among the areas of interest described below.

### Immunology

The curriculum currently focuses on genetic regulation of the immune response, molecular mechanisms of the regulation of class II genes, and the function and regulation of T-cell-derived cytokines. Students take courses in cell biology, immunology, and molecular immunology.

### Immunology and Molecular Biology of Parasitic and Other Infections

This area of interest introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. The program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

## Infectious Disease Epidemiology and Tropical Public Health

This area of interest provides a solid understanding of epidemiology, ecology, and control of infectious diseases in developing countries. It emphasizes control and prevention measures and the biological basis of diseases caused by pathogens that range from viruses to parasites.

## Vector Biology, Ecology, and Control

This area of interest focuses on the manner in which blood-feeding arthropods interact with their various vertebrate hosts and with the human pathogens that they transmit. This area combines biological experimentation, epidemiological analysis, and population studies. Students become familiar with the various arthropods that are associated with human disease and learn the ways environmental change may result in ill health. Students conduct studies on mechanisms of transmission of vector-borne pathogens, both in the laboratory and in the field, and devise novel intervention strategies.

## Virology

This area of interest is designed to prepare a future generation of experts for new developments in the pathogenesis and prevention of AIDS and other infectious diseases. At present the program emphasizes the epidemiology, biology, and vaccinology of AIDS as an example of a complex infectious disease. Students take courses in virology, vaccine development, and related fields.

## Degree Programs in Immunology and Infectious Diseases

The department offers two doctoral degree programs. The program leading to the doctor of science (SD) degree in immunology and infectious diseases is designed for candidates holding a clinical degree (MD, DVM, DMD, or equivalent) and interested in immunology and infectious diseases. The SD degree is also available to candidates without a clinical degree who wish to focus on the epidemiology of infectious diseases and who apply to the Program in the Epidemiology of Infectious Disease. The doctor of philosophy

(PhD) program is designed for all other candidates. Please note that the application requirements for the PhD and SD programs are different in that the GRE subject test is required for the PhD program. The department does not offer a master of science program.

### *Doctor of Philosophy in Biological Sciences in Public Health (Immunology and Infectious Diseases)*

Students wishing to study cellular and molecular biology, immunology, virology, or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

Applicants generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants must take both the GRE general and subject tests by November in order to meet the application deadline of December 15, 2000.

The PhD program is designed to train scientists in state-of-the-art concepts and methods in immunology, immune system disorders, virology, the biology of parasites, or important infectious diseases. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in this program engage in laboratory rotations in three different research areas to enable them to assess realistically their interest in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

For more information about the SD program in immunology and infectious diseases or other departmental inquiries, please contact the assistant to the chair, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-0975

Fax: 617-739-8348

Web: [www.hspf.harvard.edu/Academics/iid/index.html](http://www.hspf.harvard.edu/Academics/iid/index.html)

For application materials and information about admission to the PhD Program in Biological Sciences in Public Health (program 8500), please contact the Graduate School of Arts and Sciences Admissions Office, Harvard University, 8 Garden Street, Cambridge, MA 02138.

Phone: 617-495-5315

Applicants who have specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4470

Fax: 617-432-0433

E-mail: [kenworthy@cylab.harvard.edu](mailto:kenworthy@cylab.harvard.edu)

Web: [www.hspf.harvard.edu/Academics/dbs/index.html](http://www.hspf.harvard.edu/Academics/dbs/index.html)

**David Ashford**

**Medical Epidemiologist, Centers for Disease Control and Prevention  
Adjunct Professor, Epidemiology, Rollins School of Public Health, Emory University**

**David Ashford, a veterinarian, received his SD from HSPH, where he focused on tropical public health, in 1996. After leaving HSPH, he spent a year at the U.S. Department of Agriculture researching the development of a toxoplasmosis vaccine. From there he joined the Meningitis and**

**Special Pathogens Branch of the Centers for Disease Control and Prevention (CDC). In his present position Ashford is responsible for surveillance and control issues concerning anthrax, leptospirosis, meningitis, and non-TB mycobacterial diseases—primarily, but not exclusively, in the United States.**

**An expert on anthrax, Ashford also is involved in the CDC's efforts in preparedness and planning for bioterrorism in the United States. "The state health departments are our constituents," he says. "We are helping them strengthen their laboratory diagnostic capabilities and assisting in building the overall national capacity for responding to a biological terrorist event."**

**Ashford is a commander in the United States Public Health Service.**

#### **Related Offerings**

**Program in the Epidemiology of Infectious Disease, see page 50.**

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

#### ***Doctor of Science in Immunology and Infectious Diseases***

The SD program is designed to prepare students for postdoctoral research fellowships; junior faculty positions at academic institutions; and positions in independent research institutions, governmental agencies, and the biotechnology industry. The program is designed for those interested in immunology, molecular biology, virology, and epidemiology of infectious diseases. Students choose a faculty adviser whose research interests match their own when beginning to research their thesis topic.

This program aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course work during the first one or two

years emphasizes cellular and molecular biology, virology, immunology, and genetics. Course work for students focusing on the epidemiology of infections also emphasizes epidemiology, biostatistics, and ecology. Required courses for all concentrations include schoolwide requirements in epidemiology (EPI 200 or EPI 201) and intermediate biostatistics (BIO 210 or BIO 211 or equivalent), as well as appropriate courses for one major (20 credits) and two minor fields (10 credits each). Electives are chosen according to a student's needs and interests. As well as at HSPH, courses may be taken at Harvard Medical School, Harvard Graduate School of Arts and Sciences, and MIT.

Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Longwood campus. The department emphasizes publication of research results in the standard research literature, and most doctoral students publish several papers before completing the degree. Students must pass the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis based on intensive laboratory research under the guidance of a faculty adviser in the student's area of concentration.

#### **Financial Support**

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, at least one special scholarship is available each year for a student from a developing, sub-Saharan African country. A university-wide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

For the SD program, limited funding is available to qualified students who are U.S. citizens or permanent residents. A training grant from the NIH Fogarty Institute also provides some support for international students.



## Department of Maternal & Child Health



***The goal of the Department of Maternal and Child Health is to improve the health of women and children through basic and applied research, through preparation of professionals for leadership positions, and through advocacy and community service.***

Faculty members in the Department of Maternal and Child Health (MCH) undertake research in eight major areas: the prevention of infant mortality and morbidity, including risk factors for adverse outcomes of pregnancy, management of childbirth, and its effect on both the course of labor and neonatal outcomes; growth and nutrition, including dietary assessment methodologies for women and children, the assessment and management of toxic-substance exposures, and the impact of nutrition education interventions for low-income women in the postpartum period; children with special care needs, their identification, and the medical and educational services designed to meet these needs; adolescent health, including the origins of psychiatric morbidity, delinquency, violence, and substance abuse; the origins and sequelae of wife and child abuse, women's mental health, and victimization; determinants of contraceptive utilization; the organization of reproductive health services in the context of health-sector reform in developing countries; the organization of health services, including studies of the planning, policy development, and performance of federal, state, and local public and private health agencies; and the evaluation of managed care and public health interventions like Healthy Start on the use of health services by women and children in the United States.

The department's academic curriculum includes courses on maternal and child health problems of public health significance; the physical, social, and cognitive stages of human development; women and health; maternal and child health services; the roles of governmental, private, and voluntary health agencies; research methods; and the methodology of program planning, policy formation, and program evaluation in maternal and child health. Students focusing on maternal and child health are expected to acquire an understanding of normative growth and development, definition and research in maternal and child health problems, maternal and child health services, legislation supporting health and social services for mothers and children, and the planning of such services. All students fulfill the schoolwide requirements for basic courses in biostatistics and epidemiology.

For more information about research and training in maternal and child health, please contact Patricia Lavoie, Department of Maternal and Child Health, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-3762

Fax: 617-432-3755

E-mail: tlavoie@hsph.harvard.edu

Web: [www.hsph.harvard.edu/Academics/mch/index.html](http://www.hsph.harvard.edu/Academics/mch/index.html)

For more information about the Simmons College component of the dual-degree program, please call 617-521-2141.

## Degree Programs in Maternal and Child Health

As described below, the department offers both 80-credit and 40-credit master of science (SM) programs, a dual-degree master's program for nurses, and a doctoral program leading to the doctor of science (SD) or doctor of public health (DPH) degree.

### ***Master of Science in Maternal and Child Health (80-credit program)***

The 80-credit SM program is designed to prepare students for midlevel positions as project analysts, service coordinators, and managers in the field of maternal and child health. Recent graduates have taken such positions as associate director of Campaign for Our Children and training coordinator for the HIV Prevention Training Center.

Applicants to this program should have either a master's degree in a field not directly related to health (such as law, education, sociology, or statistics) or a bachelor's degree in a health-related field and at least two years of relevant work experience.

Of the 80 credits necessary to earn this degree, at least 30 must be earned in departmental courses or approved courses in other departments. Students in this program must also fulfill core requirements in biostatistics, epidemiology, environmental determinants of health, social and behavioral sciences, and health policy, planning, and administration. A minimum of 5 credits must be earned in fieldwork either during the summer between the two years or in the second academic year.

### ***Master of Science in Maternal and Child Health (40-credit program)***

The 40-credit SM program is designed to prepare health professionals for research careers in public and private agencies. Recent graduates have taken such positions as director of adolescent medicine at New England Medical Center, associate director of public health and research at Georgetown University, and assistant medical director of the Rhode Island Health Department; others have gone on to earn doctoral degrees.

Applicants eligible for this program are established practitioners or investigators holding prior master's or doctoral degrees in a related field such as medicine, dentistry, nursing, social work, nutrition, physical therapy, psychology, health education, or anthropology.

Of the 40 credits necessary to earn this degree, 20 must be earned in the Department of Maternal and Child Health or in approved courses from other departments.

**Quantitative and evaluation methods.** Students in the 40-credit SM program may choose to focus on a special area of interest: quantitative and evaluation methods. This area of interest is designed to prepare health professionals for work in public and private agencies and places emphasis on quantitative methods, program evaluation, analysis of administrative data sets, and applied epidemiology. In addition to the regular requirements, this specialization includes an eight-week internship during the spring semester in an applied MCH setting, with placements typically at the Centers for Disease Control and Prevention or in state or local MCH agencies. The specialization also requires course work on screening, needs assessment, and program evaluation. The standard duration is twelve months, with course work beginning during the summer prior to the academic year; however, an accelerated nine-month program is also available. Graduating students in this area typically take positions as program evaluators/ epidemiologists for MCH agencies.

### ***Master of Science in Maternal and Child Health (HSPh) and Parent-Child Nursing (Simmons College) (dual-degree, two-year program)***

This dual-degree program is designed to prepare nurse practitioners for leadership roles in child, youth, women's, or school health programs. Recent graduates have taken such positions as director of clinical services for the Family Planning Association of Maine and staff director for the World Health Organization's Maternal Health and Safe Motherhood Program.

Applicants should hold a bachelor's degree from a program accredited by the National League for Nursing, a license to practice nursing, and the equivalent of at least three years of full-time nursing experience. International nurses with equivalent backgrounds are eligible to apply. Applicants must meet the general admission requirements of both HSPH and Simmons College.

Students enroll in half-time study at both Simmons College and HSPH for two academic years, in addition to studying at Simmons for one summer session. The curriculum of the HSPH portion of the program is the same as that for the 40-credit SM program. Continued matriculation is dependent on maintaining satisfactory academic progress in both programs.

#### **Doctor of Science in Maternal and Child Health/Doctor of Public Health**

The doctoral programs are designed to prepare public health professionals for research careers in academic institutions and in public and private health agencies, and for leadership roles in national and international organizations. Recent graduates have taken such positions as scientist/study director at the National Academy of Sciences and faculty positions in universities.

Applicants must have an advanced degree in a health field related to maternal and child health. They are expected to have a sound academic record with documented proficiency in the quantitative sciences, relevant work experience, and research interest in an area consonant with the goals of the department.

Doctoral candidates must spend two years in residence completing course work leading to a major (20 credits) in maternal and child health and minors (10 credits each) in two other fields. Students must pass the departmental written examination and the school-wide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and complete, defend, and submit a thesis based on independent research.



**Robin Blum**

**Master of Science Student**

Robin Blum, who just completed her SM in the Department of Maternal and Child Health (MCH), came to HSPH with some experience in epidemiology and public health research. As an undergraduate at Mt. Holyoke College, the Oregon native taught women's health workshops at the campus health center and in the dorms. She also did a summer internship at HSPH, conducting research for the renewal of the Health Professionals Follow-up Study grant. After col-

lege graduation Blum worked as a research assistant on the Growing Up Today Study, where she was exposed to study design and cohort study protocol.

Blum chose the MCH department to pursue her interest in dietary assessment and nutrition surveillance and intervention for pregnant women and children one to five years old. She says she would like to "apply the knowledge I've gained at HSPH in a 'hands-on' way," perhaps working in program planning and evaluation at a state department of public health or at an organization like the Centers for Disease Control and Prevention.

#### **Financial Support**

A limited number of tuition fellowships for health professionals in the 40-credit master's degree programs (SM, MPH) and for doctoral students are available through a federally funded training grant from HRSA's Maternal and Child Health Bureau. These traineeships require U.S. citizenship or permanent residency. Additional limited tuition support may be available for other master's and doctoral students.

#### **Related Offerings**

**MPH concentration in family and community health, see page 47.**

**Women, gender, and health course offerings, see page 50.**



## Department of Nutrition

The Department of Nutrition provides training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are long-standing interests of the department, particularly as they concern the populations of Latin America, Africa, Asia, and the United States. The work of the department extends from molecular biology to human studies of cancer and heart disease. Students learn and use the latest techniques in biochemistry, physiology, biostatistics, epidemiology, and related fields. Departmental research, whether basic or applied, is relevant to human health.

Current research covers a wide range of topics, including large prospective studies of dietary factors in relation to heart disease, cancer, diabetes, and ophthalmologic disease; development of methods to assess nutritional status by analysis of body tissue; the interaction of nutritional factors with genetic determinants of disease; the interaction of nutritional factors and infectious agents; nutritional influence on blood pressure; effects of nutrition programs on the mental and physical consequences of malnutrition; nutritional determinants of blood lipid factors; lipoprotein metabolism; molecular mechanisms of diabetes and obesity; regulation of the intra- and intercellular delivery of macromolecular nutrients; and the molecular mechanism leading to atherosclerosis and thrombosis.

*The mission of the Department of Nutrition is to improve human health through enhanced nutrition. The department strives to accomplish this goal through research aimed at improved understanding of how diet influences health, the dissemination of new knowledge about nutrition to health professionals and the public, the development of nutritional strategies, and the education of researchers and practitioners.*

### Degree Programs in Nutrition

As described below, the department offers two doctoral programs. The first is a doctor of philosophy (PhD) program in nutritional biochemistry or cardiovascular biology. The second is a program in nutritional epidemiology/international nutrition leading to the doctor of science (SD) or doctor of public health (DPH) degree. Applicants for the nutritional biochemistry or cardiovascular biology program who hold a clinical degree in medicine, veterinary medicine, or dentistry may prefer to follow a different curriculum leading to the SD degree; this option may be available by special arrangement with the department.

Some graduates have assumed positions as faculty members and research scientists at medical schools, research institutes, and schools of public health; others have gone on to careers as public health nutritionists in international organizations or federal, state, or local governments. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

***Doctor of Philosophy in Biological Sciences in Public Health (Nutritional Biochemistry/ Cardiovascular Biology)***

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through Harvard University's Graduate School of Arts and Sciences.

Applicants to the PhD program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Those deficient in one of these areas may be admitted provisionally on the condition that

appropriate courses will be taken before and/or after entering the program. Applicants must take both the GRE general test and at least one science subject test by November in order to meet the application deadline of December 15, 2000.

The PhD program in nutritional biochemistry offers rigorous training in biochemistry, cell biology, and metabolism, allowing students to work toward solving nutritional and metabolic problems in the laboratory. Students in cardiovascular biology learn to use cutting-edge technologies from molecular biology, biochemistry, and genetics to critically dissect the mechanisms underlying cardiovascular diseases such as heart attacks, strokes, heart failure, atherosclerosis, and congenital heart disease. Both programs also offer a firm foundation in epidemiology and biostatistics. Specific courses, as dictated by individual research concentrations, supplement this core. Students in this program engage in laboratory rotations in three different research areas to enable them to assess realistically their interests in a thesis project and to evaluate the suitability of the laboratory and the mentor. At the completion of these rotations, students select an area of

For more information about research and training in nutritional epidemiology/international nutrition, please contact Chelsea Merz, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1333

Fax: 617-432-2435

E-mail: [nutrition@hsph.harvard.edu](mailto:nutrition@hsph.harvard.edu)

For application materials and information about admission to the PhD Program in Biological Sciences in Public Health (program 8500), please contact the Graduate School of Arts and Sciences Admissions Office, Harvard University, 8 Garden Street, Cambridge, MA 02138.

Phone: 617-495-5315

Applicants who have specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4470

Fax: 617-432-0433

E-mail: [kenworthy@cylab.harvard.edu](mailto:kenworthy@cylab.harvard.edu)

Web: [www.hsph.harvard.edu/Academics/dbs/index.html](http://www.hsph.harvard.edu/Academics/dbs/index.html)



**Walid Aldoori**  
Medical Director, Nutritionals,  
Whitehall-Robins

Walid Aldoori, a native of Iraq, first came to the United States in 1989 when he won a scholarship from the Kennedy School. A physician by training, and a professor at Jordan University in Amman, he wanted to focus on health and nutrition policy. While at the Kennedy School, Aldoori cross-registered for some courses at HSPH. "I became fascinated by the research of Dr. Walter Willett on the association between diet and chronic disease, so I decided to acquire new skills," he says. "I applied to his group and was fortunate to be accepted."

In his current role at Whitehall-Robins in Canada, a division of American Home Products, Aldoori is involved in research and development, scientific publications, training of the medical sales force, and continuing medical education (CME) for health professionals. In the last area he developed an interactive training program on nutrition education for health professionals that was approved as a for-credit course at CME events.

With all his professional activities and responsibilities, Aldoori, who holds an SD in nutrition, has maintained his ties to his research group at HSPH.



#### **Related Offerings**

- Interdisciplinary Program in Molecular Epidemiology, see page 50.**
- MPH concentration in family and community health, see page 47.**

concentration and a thesis research laboratory and complete the required curriculum. A qualifying examination must be passed before engaging in thesis work, and the thesis must be defended before the granting of the PhD.

#### ***Doctor of Science in Nutrition/Doctor of Public Health***

The program in nutritional epidemiology/international nutrition leading to the SD or DPH degree provides rigorous training in epidemiology and biostatistics as well as the biological aspects of nutrition. The overall objective is to enable students to investigate relationships between diet and disease.

The program includes formal course work, a practical research project, a seminar, and a thesis research project. Students must pass the departmental oral comprehensive examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress;

and complete, defend, and submit a thesis. In addition to fulfilling the schoolwide doctoral requirements in introductory epidemiology (EPI 200 or EPI 201) and intermediate biostatistics (BIO 210 or BIO 211), students must complete a major (20 credits) in nutrition and two minors (10 credits each), one of which must be in epidemiology. Students in a joint program with the Department of Epidemiology must satisfy the course requirements of both departments, select a minor field acceptable to both departments, and write a thesis on a topic concerning both nutrition and epidemiology.

Applicants must have a strong background in biology and mathematics. An MD or other professional health-related degree is desirable but not required. Admission to a joint program with Epidemiology requires the approval of both departments, and applicants should contact the Department of Nutrition before making formal application.

#### ***Financial Support***

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. A universitywide fellowship program also provides funding to qualified underrepresented minority students in the sciences.

For the SD and DPH programs, funding may be available through the NIH-supported Training Program in Nutritional Science for students with previous doctoral degrees.



*The Department of Population and International Health seeks to improve global health problems through education, research, and service from a population-based perspective. The twenty-first century has arrived with complex changes in demographic patterns, disease burdens, and health policies. These changes are affecting all societies, rich and poor, developed and developing. The department's approach to these problems combines the analysis of population and health intersections using quantitative and qualitative methods, the investigation of real-world policies that affect health, and a concern with the political economy of health and development.*

## Department of Population & International Health

The department's members generate knowledge and ideas through their research, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in developing countries. Drawing on anthropology, demography, ecology, economics, epidemiology, ethics, medicine, political science, reproductive biology, and sociology, department faculty members apply their disciplinary expertise to population and international health issues. The department's research interests span a wide spectrum of topics, including social and economic development, health policy, and demography; design and financing of health care systems; women's health, reproductive health, and children's health; and prevention and control of infectious and chronic diseases. The department has a special concern with questions of health equity and human rights, particularly in relation to health and population issues in developing countries.

Students in the department come with various backgrounds. Some have had advanced training in the biological or social sciences or extensive experience in applied fields related to population sciences. Others begin with bachelor's-level training. Many students are from developing countries. All have an interest in the health of disadvantaged populations worldwide.

### Degree Programs in Population and International Health

As described below, the department offers both an 80-credit master of science (SM) program and a program leading to the doctor of science (SD) or doctor of public health (DPH) degree. In addition to these programs, the department hosts research fellows and mid-career leaders in population and health research and undertakes cooperative technical projects overseas.

For more information about research and training in population and international health, please contact the Education Office, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-2253

Fax: 617-566-0365

E-mail: [ajaimung@hsph.harvard.edu](mailto:ajaimung@hsph.harvard.edu)

Web: [www.hsph.harvard.edu](http://www.hsph.harvard.edu)

For more information about courses related to Bio- and Public Health Mathematics, please contact Tamara Averbuch, PhD, Department of Population and International Health, 665 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-2505

Fax: 617-566-0365

E-mail: [tamara@hsph.harvard.edu](mailto:tamara@hsph.harvard.edu)

### ***Master of Science in Population and International Health***

The department's SM program offers two tracks, each comprising 80 course credits, geared toward preparing individuals for academic and public service careers, respectively. Students on the academic track generally continue with doctoral work at the end of the master's program. Graduates of the professional track pursue a variety of careers in national and international agencies and institutions.

In both tracks the courses and the thesis work are based on practical aspects of current health and population issues in developing countries and at the same time introduce students to the major theoretical issues in international health and population. In addition to meeting school requirements in biostatistics and epidemiology (and, for professional students, in environmental health, health services administration, and social and behavioral sciences), students acquire a grounding in the concepts and tools used for field survey work, experience with data analysis and qualitative research methods, and familiarity with the classic literature in population and international public health.

The first year of study is devoted to full-time course work. During the summer between the first and second years, students are encouraged to gain practical experience by undertaking an internship. The second year generally involves a combination of course work and independent research linked to completion of a required master's thesis, which is usually based on the summer internship experience. The thesis provides an opportunity for the student to bring together the conceptual models and analytic skills presented in the courses and to apply them to a single issue. For students continuing into a doctoral program, the thesis often forms the core of the research proposal for more advanced work.

Applicants must hold a bachelor's degree or equivalent, though many students already hold advanced degrees in medicine or a social science discipline. The program

### **Bio- and Public Health Mathematics**

Several departments offer courses designed to promote research and education in mathematics as applied to scientific problems in public health and medicine. The Committee on Bio- and Public Health Mathematics has compiled a list of courses teaching the development or implementation of mathematical tools in public health research.

strongly prefers applicants with relevant work experience in population or international public health.

No concentrations are offered at the master's level.

### ***Doctor of Science in Population and International Health/Doctor of Public Health***

The doctoral programs are designed to prepare students both for professional leadership positions in the public or private sectors of public health and for academic careers in universities or research institutions. Recent graduates have taken positions with the Centers for Disease Control and Prevention, the World Bank, and nongovernmental organizations, and postdoctoral and teaching positions with universities in the United States and around the world.

Desired applicants have outstanding academic records, substantial relevant experience in the international public health arena, and professional interests that correspond to one of the department's three doctoral concentrations: population and reproductive health, international health policy and economics, and international health epidemiology and ecology. A master's degree is recommended but not required for entry into a doctoral program. Students may enter the department's 80-credit master's degree program and apply to enter the doctoral program at a later date. Entry to the doctoral program will then depend upon outstanding performance in the master's degree program and acceptance through the regular doctoral program admission process.

Two academic years of full-time residence at the graduate level are required. The first year is ordinarily devoted to course work. The second year usually involves both course work and research planning. Subsequently additional courses are taken to fulfill remaining requirements and/or to gain special skills related to thesis research. The pace of progress depends largely on the student's individual plan, which is designed in collaboration with an adviser and thesis committee. Ultimately students must demonstrate detailed knowledge and understanding of a major field (20 credits) and two minor fields (10 credits each); pass both the departmental written examination and the schoolwide oral qualifying examination; adhere to the doctoral timetable for maintaining satisfactory progress; and prepare, defend, and submit a thesis based on original research.

The major field must be chosen from one of the concentrations offered by the department, as described below. Minor fields may also be chosen from the department or from allied departments of the school or university, including the Departments of Biostatistics, Epidemiology, Health and Social Behavior, Immunology and Infectious Diseases, Nutrition, or Maternal and Child Health. The departmental concentrations promote skill development, encourage multidisciplinary approaches to health problems, and provide opportunities for extensive linkages in diverse field settings in Africa, Asia, or Latin America.

**International health epidemiology and ecology.** This concentration is designed for students who wish to take a broad, integrated approach to researching health problems and to developing the methods for such study. Students acquire an understanding of health as part of the relationships between people and between humans and nature in the contexts of evolution, environmental change, infectious disease ecology, economic development, and demography. Through this process students gain skills to identify the determinants, consequences, and dynamics of health problems and learn to plan, implement, and evaluate health promotion and disease prevention strategies and programs.



**Davida Becker**  
Master of Science Student

Davida Becker, an SM student in the Department of Population and International Health, says she would like to be involved in women's health issues on a global basis. Becker has always been interested in working overseas and has a great deal of experience traveling and studying abroad. As an undergraduate at the University of California, Berkeley, concentrating on women, health, and development, she spent a year studying in Nepal. She has also been involved with volunteer programs in Latin America.

Becker believes it is important to combine qualitative and quantitative analysis when looking at health trends. "I think numbers only present part of the picture," she says, "They don't include things like perception of health. In addition to the numbers, I want to look at the social and environmental factors that affect health."

The epidemiologic component of this concentration emphasizes the application of the combination of ecological, population-genetic, and evolutionary theories with qualitative mathematical methods on international patterns of health and disease. The ecological dimension of the curriculum focuses on health aspects of ecology and the inseparability of social and biological aspects of human ecology. Students also acquire in-depth knowledge of a sampling of major disease problems, ecological habitats, and health programs.

**International health policy and economics.** This concentration is designed for students who wish to develop skills and pursue research on the economic and political analysis of health policy in developing countries. The concentration has three main dimensions. First, it provides students with doctoral-level knowledge in theory, analysis, and research methods in either political science or economics so that they are able to perform doctoral research in this area. Second, the concentration offers students a broad education in population sciences, epidemiology, and

### The Takemi Program in International Health

The Takemi Program is a nondegree program offering fellowships for research and advanced training in critical issues of international health, especially those related to developing countries. The program is interdisciplinary in nature and addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. The research interests of fellows are usually related to a policy problem in their own country.

Takemi fellows are professionals and scholars from around the world with training and experience in public health, medicine, economics, policy analysis, biological science, and other fields. The program enables individuals in the early or middle stages of their careers to strengthen their knowledge and skills in health, economics, epidemiology, political analysis, or other analytic methods. It is not designed for projects with biomedical laboratory requirements.

The program can fund a limited number of fellowships each year and can assist in identifying external sources of funding, which applicants are encouraged to pursue.

provides students with the basic skills to measure demographic and health trends and to understand how fertility, mortality, age structure, and reproductive health are inextricably linked. Students become familiar with the global and regional components of reproductive health, its determinants, and consequences. International and local policies, as well as services for promoting family planning, reproductive health, and family health, are examined and their effects evaluated.

The concentration stresses a population-based approach to international health issues. Comparative analysis is used to highlight disparities, similarities, and differences between developed and developing countries' experiences and between different social classes within a single population. There is a strong emphasis on field methods and practical aspects of data collection, analysis, and presentation. Though faculty members are drawn from a variety of disciplinary backgrounds, all have close contact with contemporary population and reproductive health problems in developing countries.

Faculty research in this concentration includes the design and use of qualitative and quantitative methods for the study of reproductive mortality and morbidity; infertility and its determinants and consequences; the fertility transition in poor countries; the design and evaluation of family planning and reproductive health services; gender-based perspective and differentials in fertility, health, and mortality; intergenerational relations in developing countries; and policy reform following the 1994 Conference on Population and Development.

This concentration has strong regional interests in South and East Asia, sub-Saharan Africa, North Africa, and the Arab world.

For more information about the Takemi Program in International Health, please contact Michael R. Reich, PhD, 665 Huntington Avenue, Boston, MA 02115. Phone: 617-432-0686 Fax: 617-432-1251 E-mail: [takemi@hsph.harvard.edu](mailto:takemi@hsph.harvard.edu)

#### **Related Offerings**

**MPH concentration in international health, see page 47.**

**Program in the Epidemiology of Infectious Disease, see page 50.**

issues and institutions in international health. Third, a component on the political economy of international health complements the training in economics.

Students in this concentration choose to focus on either economics or political science. Candidates who emphasize economics are required to take microeconomic theory, econometrics, and other field economics such as welfare and development economics equivalent to the level offered by a doctoral program in a standard economics department. Candidates less well prepared in quantitative methods usually take a year longer to complete the course work required for the program. Applicants are encouraged to contact faculty members in the concentration to discuss necessary levels of quantitative skills required for entry.

**Population and reproductive health.** This concentration is designed for students who are interested in the interdisciplinary study of human fertility, health, and mortality and who desire a population-based perspective on the changing patterns of mortality and morbidity worldwide. A core curriculum



## Interdisciplinary Programs

### Master of Public Health Program

The master of public health (MPH) degree is the most widely recognized professional credential for leadership in public health. The program is organized around seven career-oriented concentrations; in addition to the common core curriculum, each concentration offers specialty electives. The program emphasizes active, student-directed learning, problem solving, and the acquisition of skills essential to the practice of public health.

Coming from all parts of the world, MPH students bring to the program a wide variety of backgrounds and experiences. The majority of these students are midcareer professionals preparing for advancement in their organizations or for transition into new fields. Most hold a professional degree in medicine, nursing, veterinary medicine, or law. Some hold a doctoral degree in a field related to public health, such as biology, behavioral sciences, or other natural and social sciences. On occasion an individual is admitted to the program who holds a master's degree in a field closely related to public health and who has at least three years of relevant work experience.

Students enrolled in MD, DMD, or DDS programs (and some law students already holding an advanced degree) and who have a career interest in public health and/or preventive medicine are eligible to apply for admission to the MPH program. Generally these students undertake the MPH program while on leave of absence between the third and fourth year of medical or dental school. They receive the MPH degree upon successful completion of both programs and conferral of the doctoral degree. Students at Harvard Medical School may wish to inquire about the possibility of undertaking an integrated MD-MPH program. The MPH program serves as a required academic year for residency training in preventive medicine, aerospace medicine, or occupational and environmental medicine.

MPH candidates may complete the requirements for the degree on a full-time or part-time basis (or may change from one status to the other). Full-time students normally complete the program in two semesters (September through May). Part-time students complete the requirements for the degree over a period of two or three years. Students in the quantitative methods or clinical effectiveness concentrations may apply for the summer MPH program, which can be completed by taking courses in three consecutive enrollments in the Summer Session for Public Health Studies. A maximum of 20 credits of course work taken as a nondegree student can be transferred into

**Yvette Roubideaux**

**Clinical Assistant Professor, College of Public Health and College of Medicine, University of Arizona**  
**President, Association of American Indian Physicians**

**For the past several years Yvette Roubideaux, MD, MPH '97, has focused her career on teaching, research, and program development in the areas of diabetes and Indian health policy. In addition to her academic positions, she is involved with several national projects related to diabetes in American Indians.**

Roubideaux received her MD from Harvard Medical School in 1989 and worked as a clinical director and medical officer at hospitals on the San Carlos Apache and Gila River Indian reservations. These experiences showed her the significant disparities in the health of Indian communities compared to the general population, as well as the lack of resources to address these inequities.

With a desire to grapple with Indian health problems at the community and population level, and to assume management and leadership positions in Indian health, Roubideaux returned to Harvard. She says that completing the MPH degree and the Commonwealth Fund/Harvard University Fellowship in Minority Health Policy gave her the skills she needed to help improve the health of American Indian communities and to train others to do so.

For more information about the MPH program or the summer MPH in quantitative methods or clinical effectiveness, please contact Roberta Gianfortoni, director for professional education, Office for Professional Education, 677 Huntington Avenue, Boston, MA 02115. Phone: 617-432-0090 Fax: 617-432-3365 E-mail: rgianfor@hsph.harvard.edu Web: [www.hsph.edu/mph](http://www.hsph.edu/mph)

a subsequent degree program. Students in the Summer Session are normally limited to 10 credits per summer; students in the Summer Program in Clinical Effectiveness are limited to 15 credits per summer. Students wishing to apply for the summer MPH in quantitative methods or clinical effectiveness must observe the same admissions deadlines as all MPH degree applicants.

MPH students are required to complete a minimum of 40 course credits and must fulfill core requirements in the fundamental public health disciplines. These requirements include an interdisciplinary course on the ethical basis of the practice of public health (ID 250 or 251); the practice course for the chosen concentration (see course listings on page 94); one course in biostatistics (BIO 200 or 201); one course in epidemiology (EPI 200 or 201); one course in environmental health; one course in health and social behavior; and 2.5 to 5 credits in management courses relevant to the chosen concentration.

Requirements and concentration guidelines are available from the MPH office.

Within one of the seven concentrations, applicants choose a second tier of recommended or required courses. Each concentration offers a selection of areas of interest, allowing students to explore in depth one or more spheres of particular relevance to their career goals. The concentrations and areas of interest enable students in the interdisciplinary MPH program to establish a second "home" in one of the school's academic departments, such as Health Policy and Management or Maternal and Child Health. Beyond the program and concentration requirements, students are encouraged to consult with faculty advisers to choose elective courses best suited to their needs. Concentration goals, areas of interest, and general requirements are described below.

### Clinical Effectiveness

This concentration prepares physicians for clinical research responsibilities and for leadership roles in evaluating and improving all aspects of health care delivery. Concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment, the concentration is designed to provide the analytic and quantitative training necessary to evaluate clinical practices. Along with the broad perspective the program offers on general aspects of public health, this training provides a basis for identifying the health policy implications and public health benefits of the results of clinical investigations. Major areas of professional interest for concentrators include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life. The concentration is limited to clinicians enrolled initially in the Summer Program in Clinical Effectiveness.

### **Family and Community Health**

This concentration focuses on the promotion of health and the prevention of disease in populations by preparing health professionals with leadership skills in public health. Courses emphasize strategies for establishing health objectives, data collection and analysis, the management of fiscal and manpower resources, consultation, communication, advocacy, and policy formation in the public sector. The program prepares students for positions in diverse public health and non-profit settings, including federal, state, and local government; voluntary health organizations; and community-based primary care settings. Positions filled by program graduates include public health administrator, health planner, health policy analyst, and health educator; others have gone on to undertake doctoral study.

Beyond the MPH core requirements, students are encouraged to develop expertise in a focus area geared to their professional interests. Areas of interest include maternal and child health, community health, financial analysis, mental health and substance abuse, women and health, and health promotion and disease prevention.

### **Health Care Management**

This concentration prepares professionals for leadership positions in health care organizations that provide direct care (such as hospitals, group practices, and home health agencies), those that pay for and/or organize health care (such as governments, health insurers, and health maintenance organizations), and those that supply direct-care providers (such as pharmaceutical companies and biotechnology firms). Course work covers the growing role of managed care in the health care enterprise. Program graduates fill many roles—from consultants and staff analysts, to middle-management and executive positions.

Beyond the MPH core requirements, students choose either a management or a policy area of interest, representing different disciplinary approaches to public health. Students select from clusters of recommended courses to gain depth in their chosen area.

### **International Health**

This concentration is intended to prepare health professionals for leadership roles in the practice of international health, with a special emphasis on the health problems of populations in developing countries. The concentration enables students to work toward health improvement by taking account of demographic and epidemiologic changes; the organization of health care and evolving patterns of health care demand; new scientific knowledge and technology; and the roles of professionals in policy, law, communications, and advocacy. It also assists them in finding new ways to strengthen national and institutional capacities for health policy making and management.

Graduates of the program have assumed leadership positions in national ministries of health, international organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

The international health concentration has several areas of professional interest, including international health policy and management; population, reproduction, and child health; infectious disease epidemiology; research and evaluation methods; and health promotion.

### **Law and Public Health**

This concentration is designed to train leaders in the field of public health law. The course of study introduces lawyers to the science of public health, provides them with skills in analysis of public health problems, and allows them to design a curriculum that will meet their particular interests. The concentration prepares graduates for positions in a variety of settings, including work in a health law or environmental section of a law firm; positions in local, state, and federal government; or posts in academia.

Beyond the MPH core requirements, lawyers are encouraged to develop an area of interest by choosing among clusters of recommended courses in such fields as health care delivery or environmental health.

***Related Offerings***

**MOH program, see page 15.**

**Occupational and Environmental Medicine Residency, see page 19.**

**Summer Program in Clinical Effectiveness, see page 53.**

**Summer Session for Public Health Studies, see page 53.**

For application materials and information about admission to the PhD Program in Biological Sciences in Public Health (program 8500), please contact the Graduate School of Arts and Sciences Admissions Office, Harvard University, 8 Garden Street, Cambridge, MA 02138.

Phone: 617-495-5315

The deadline for application to the PhD program is December 15, 2000.

Applicants who have specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 655 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4470

Fax: 617-432-0433

E-mail: kenworthy@cvlab.harvard.edu

Web: <http://www.hsph.harvard.edu/Academics/dbs/index.html>

For application materials and information about admission to SD programs, please contact Office of Admissions, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1031

Fax: 617-432-2009

The deadline for application to SD programs is December 15, 2000.

**Occupational and Environmental Health**

This concentration is designed for physicians and other professionals who intend to practice occupational/environmental medicine or to hold responsible positions in occupational and/or environmental policy and management. The curriculum focuses on assessing workplace and environmental hazards, the physiologic and biomechanical aspects of work, the risks posed by the interaction of genetic and environmental factors, and a practical approach to solving health problems in various work and community settings.

The concentration features three areas of interest: occupational/environmental medicine, occupational health, and environmental health. The occupational/environmental medicine area is designed for physicians who intend to satisfy the requirements of the American Board of Preventive Medicine for certification in occupational and environmental medicine. The requirements for the master of occupational health (MOH) degree are similar to those of the MPH in occupational medicine; physicians may elect either degree. This concentration also fulfills the first-year requirements of the two-year Occupational and Environmental Medicine Residency.

**Quantitative Methods**

This concentration prepares students for public health careers in which quantitative methods are central. It is designed for both midcareer health professionals and those in the early stages of their careers. The concentration emphasizes study design, data analysis, and the application of quantitative methods to decision making and to research in public health. Program graduates commonly supervise population-based health research in government, health care institutions, and private industry. Many graduates practice in academic medicine.

Beyond the MPH core requirements, concentrators must take an additional 2.5 credits of introductory epidemiology and 7.5 credits in intermediate/advanced biostatistics, epidemiology, or decision sciences and an approved period practice course. At HSPH and else-

where within the university, concentrators may choose from advanced quantitative courses that include biostatistics, epidemiology, decision sciences, demography, needs assessment, and evaluation. An area of interest in decision science is offered as an option.

**Division of Biological Sciences**

The Division of Biological Sciences is an umbrella organization encompassing the HSPH Departments of Cancer Cell Biology, Immunology and Infectious Diseases, Nutrition, and Environmental Health. In most of these departments, two doctoral degrees are offered: the doctor of philosophy (PhD) and the doctor of science (SD). The PhD programs generally center on laboratory-based investigation in the biological sciences, whereas the SD programs emphasize epidemiological analysis. The PhD program is administered by the Division of Biological Sciences.

***Doctor of Philosophy in Biological Sciences in Public Health***

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD Program in Biological Sciences in Public Health (BPH). The BPH program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. This program offers the PhD degree through Harvard University's Graduate School of Arts and Sciences.

Participating HSPH departments offer PhD programs in the following areas:

- cancer cell biology (radiobiology; toxicology)
- environmental health (physiology)
- immunology and infectious diseases (immunology and molecular biology of parasitic and other infections)
- nutrition (biochemistry; cardiovascular biology)

These programs are described in the departmental sections of this catalog.



### Donny Wong

**PhD Student, Division of Biological Sciences**

For his doctoral thesis Donny Wong is conducting research in the Department of Cancer Cell Biology, studying protein interactions of an important pathway of human DNA repair that senses and fixes damage caused by oxygen. This research may have implications for the development of mutations that lead to cancer, or for the aging process itself.

Born in Hong Kong and raised in San Francisco, Wong says the area of cellular damage caused by oxygen free radicals touches upon two great interests of his. As a high school student, he studied reactive oxygen, and as an undergraduate honors student at Williams College, he wrote his thesis on bacterial DNA repair processes.

After receiving his degree, Wong plans to do postdoctoral research, preferably in a laboratory that studies human disease. He believes his future lies in translational research, where scientific innovations interface with medicine to improve public health. But he hasn't ruled out teaching science in a small college setting. "I was a teaching assistant for *Principles of Toxicology* last fall, and I absolutely loved the experience," he says.

### DBS Elective Courses

The Division of Biological Sciences offers interdisciplinary training, with students taking courses in several different departments to meet their individual requirements. All students complete core course requirements and elective courses during their first two years of study. In addition to core courses in biochemistry, cell biology, genetics, microbiology, and physiology, students take one or more of the following elective courses, which are described in the departmental listings of this *Official Register*.

- CCB 204 *Principles of Toxicology*
- CCB 210 *Introduction to Cancer Biology*
- CCB 225 *Genetic Toxicology*
- CCB 250 *Cell Response to Mutagens and Carcinogens*
- EH 205 *Human Physiology*
- EH 223 *Advanced Respiratory Physiology*
- EH 225 *Advanced Topics in Physiology*
- IMI 204 *Survey of Immunobiology*
- IMI 208 *Immunology of Infectious Diseases*
- IMI 216 *Cellular and Molecular Biology of Parasites*
- NUT 202 *The Science of Human Nutrition*

## Division of Public Health Practice

The Division of Public Health Practice serves as a conduit between the work of HSPH academic departments, governmental and corporate agencies, and the community. The mission of the division encompasses education, research, and service.

Through education the division ensures that its students graduate with the core competencies of public health, including assessment, policy formulation, and quality assurance, and with the vision to become effective public health leaders. Through research the division advances current methods of collaborative inquiry to evaluate questions raised in community-based public health practice, as well as to address the broader policy issues concerning the health effects of social inequality. Through service the division enhances the health of underserved communities by fostering collaborative efforts between HSPH faculty, staff, and students

and community-based organizations, health departments, health care providers, and public schools to develop and implement sustainable innovative strategies.

Programs included under the umbrella of the division are the Minority Postdoctoral Fellowship Program (see below), the Office of Government and Community Programs, the Preventive Medicine Program, the Program for Health Care Negotiation and Conflict Resolution, the Program to Eliminate Health Disparities, and the Violence Prevention Program.

### **Minority Postdoctoral Fellowship Program**

The Minority Postdoctoral Fellowship Program assists in the transition between academic training in public health disciplines and entry-level faculty positions for members of underrepresented minority groups. The fellowship program provides each fellow with the opportunity for development as a scholar and as an independent researcher. Working closely with a faculty mentor, fellows estab-

For more information on the Division of Public Health Practice or the Minority Postdoctoral Fellowship Program, please contact the Division of Public Health Practice, 1552 Tremont Street, Boston, MA 02120.

Phone: 617-496-0888

Fax: 617-495-8543

For more information about research and training in molecular epidemiology, please contact Karl T. Kelsey, MD, MOH, Departments of Cancer Cell Biology and Environmental Health, 665 Huntington Avenue, Boston, MA 02115. Phone: 617-432-3313 Fax: 617-432-0107 E-mail: [kelsey@hohp.harvard.edu](mailto:kelsey@hohp.harvard.edu)

For more information about the Program in the Epidemiology of Infectious Disease, please contact James H. Maguire, MD, MPH, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115. Phone: 617-732-6801 Fax: 617-732-6829 E-mail: [jhmaguire@bics.bwh](mailto:jhmaguire@bics.bwh)

For more information about courses related to women, gender, and health, please contact Judianne Urmaza, 651 Huntington Avenue, Boston, MA 02115. Phone: 617-432-0656 Fax: 617-566-4310 E-mail: [jurmaza@hspf.harvard.edu](mailto:jurmaza@hspf.harvard.edu)

lish an independent research agenda, gain experience in publishing papers in peer-reviewed journals, obtain independent grant support, and participate in teaching related to their field. Fellows also participate in other activities designed to involve them fully in the formal and informal life of the academic community.

Candidates for this program must be U.S. citizens or permanent residents who are members of one of the following minority groups: African-American, Hispanic, Native American, or Pacific Islander. All applicants must have earned a doctoral degree in a field appropriate to their area of interest at HSPH. The fellowship is for two years and carries a competitive stipend.

### **Other Interdisciplinary Programs**

#### *Interdisciplinary Program in Molecular Epidemiology*

Molecular epidemiology, which encompasses a novel approach to the study of disease occurrence, is a focus of attention in several of the school's departments. In the Department of Environmental Health, for example, ongoing research utilizes biomarkers of exposure and exposure-related disease, as well as gene-environment interaction. The Department of Epidemiology is conducting molecular research in disease mechanism, outcome, and susceptibility. Members of the Department of Biostatistics are developing novel methods for understanding molecular and genetic parameters governing disease occurrence. Finally, researchers in the Department of Nutrition are examining whether variation in enzymes that metabolize nutrients alter the relations of diet and disease. Prospective doctoral students must apply to one of the participating departments, and the degree will be issued from that department. Students are responsible for completion of degree requirements of the home department in addition to the program's core requirements in biology, genetics, exposure assessment, and epidemiology.

#### *Program in the Epidemiology of Infectious Disease*

Education and research on aspects of infectious disease occur in a number of HSPH departments, including the Departments of Environmental Health, Epidemiology, Immunology and Infectious Diseases, Nutrition, and Population and International Health. These departments participate in the Program in the Epidemiology of Infectious Disease, which focuses on population studies incorporating both epidemiologic and laboratory methods. This doctoral program is intended for those students who desire careers in research and teaching in infectious disease. Prospective students must apply to one of the participating departments, and the degree will be issued from that department. Students are responsible for fulfilling the doctoral requirements of the home department in addition to the program's core requirements in biology, quantitative methods, and substantive infectious disease.

Alternatively the Departments of Epidemiology, Immunology and Infectious Diseases, and Population and International Health offer discipline-oriented doctoral or master's degree programs. Please refer to the appropriate sections of this catalog for descriptions of these discipline-centered degree programs.

#### *Women, Gender, and Health*

Several departments offer courses designed to increase understanding of the health of girls and women throughout the life cycle, with gender and biology understood as determinants of health, disease, and well-being. Faculty members of the interdepartmental working group on women, gender, and health offer an interdepartmental course (see page 95), and the group maintains a list of HSPH and non-HSPH courses that are relevant to women's health.

## Institutes and Centers

The school has established a number of institutes and centers to advance research in areas of importance to health. These efforts tend to be multidisciplinary in their approach, bringing together faculty from several HSPH departments and, in some instances, from several Harvard schools. Faculty members affiliated with the programs offer courses in their field of interest through the school's academic departments and often provide opportunities for student involvement in research.

### **Center for Biostatistics in AIDS Research**

Director: Stephen Lagakos, MPhil, PhD, professor of biostatistics  
Executive director: Janet Andersen, MS, SD, senior research scientist  
For more information, contact Janet Andersen  
Phone: 617-432-2814  
Fax: 617-432-2843  
E-mail: andersen@sdac.harvard.edu

### **Center for Health Communication**

Director: Jay A. Winstein, PhD, associate dean for public and community affairs  
For more information, contact Terri Mendoza  
Phone: 617-432-1038  
Fax: 617-731-8184  
E-mail: tmendoza@sph.harvard.edu

### **Center for Quality of Care Research and Education (QCARE)**

Director: R. Heather Palmer, MB, BCh, SM, professor of health policy and management  
For more information, contact Mary McCann  
Phone: 617-432-2027  
Fax: 617-432-3199  
E-mail: qcare@hsp.harvard.edu

### **Center for the Prevention of Cardiovascular Disease**

For more information, contact Michelle Bell  
Phone: 617-432-1778  
Fax: 617-432-2980  
E-mail: bell@cylab.harvard.edu

### **François-Xavier Bagnoud Center for Health and Human Rights**

Director: Stephen P. Marks, Diplôme, PhD, François-Xavier Bagnoud Professor of Health and Human Rights  
For more information, contact Judianne Urmaza  
Phone: 617-432-0656  
Fax: 617-432-4310  
E-mail: fxbcenter@igc.apc.org  
Web: www.hri.ca/partners/fxbcenter/

### **Harvard AIDS Institute**

Chair: Myron E. Essex, DVM, PhD, John LaPorte Given professor of immunology and infectious disease  
Executive director: Richard Marlink, MD  
For more information, contact Phone: 617-432-4400  
Fax: 617-432-4545  
E-mail: hai@hsp.harvard.edu  
Web: www.hsp.harvard.edu/hai

### **Harvard Center for Cancer Prevention**

Director: David J. Hunter, MB, BS, MPH, SD, professor of epidemiology  
For more information, contact Phone: 617-432-0038  
Fax: 617-432-1722  
E-mail: hccp@hsp.harvard.edu

### **Harvard Center for Children's Health**

Director: Marie C. McCormick, MD, ScD, Sumner and Esther Feldberg professor of maternal and child health  
For more information, contact Julie L. Goldman  
Phone: 617-432-3761  
Fax: 617-432-3755  
E-mail: jgoldman@hsp.harvard.edu

### **Harvard Center for Population and Development Studies**

Acting director: Barry R. Bloom, PhD, dean, Harvard School of Public Health  
For more information, contact Winifred M. Fitzgerald  
Phone: 617-495-3002  
Fax: 617-495-5418  
E-mail: wmfitz@hsp.harvard.edu  
Web: www.hsp.harvard.edu/hcdps

### **Harvard Center for Risk Analysis**

Director: John D. Graham, AM, PhD, professor of policy and decision sciences  
For more information, contact Nkwamzi Sabiti  
Phone: 617-432-4497  
E-mail: nsabiti@hsp.harvard.edu

### **Harvard Center for Society and Health**

Director: Ichiro Kawachi, MD, PhD, associate professor of health and social behavior  
For more information, contact Phone: 617-432-0235  
Fax: 617-432-3123  
E-mail: csh@hsp.harvard.edu

### **Harvard Education and Research Center for Occupational Safety and Health**

Director: David C. Christiani, MD, SM, MPH, professor of occupational medicine and epidemiology  
For more information, contact David C. Christiani  
Phone: 617-432-1260  
Fax: 617-432-0219  
E-mail: dchris@hoehp.harvard.edu  
Web: hsp.harvard.edu/erc

### **Harvard Injury Control Research Center**

Director: David Hemenway, PhD, professor of health policy For more information, contact Mary Kate Newell  
Phone: 617-432-2123  
Fax: 617-432-4494  
E-mail: hicrc@hsp.harvard.edu  
Web: www.hsp.harvard.edu/hicrc

### **John B. Little Center for Radiation Sciences and Environmental Health**

Director: John B. Little, MD, James Stevens Simmons professor of radiobiology  
For more information, contact Martha Cassin  
Phone: 617-432-0054  
E-mail: mcassin@hsp.harvard.edu

### **Kresge Center for Environmental Health**

Director: Joseph D. Brain, SM, SM, SD, Cecil K. and Philip Drinker professor of environmental physiology  
For more information, contact Arlene Kirsch  
Phone: 617-432-3483  
E-mail: akirsch@hsp.harvard.edu



## Orientation & Summer Academic Programs Continuing Professional Education

### Orientation Programs

#### English for Professional Communication

The teaching style of American classrooms is highly interactive and requires proficiency in spoken English. Students are expected to ask questions in class and to respond quickly in classroom discussions.

For non-native-English-speaking students entering HSPH, English for Professional Communication offers six hours of instruction each day for two weeks. Students practice their English-language skills by listening to and discussing material with public health content. The course focuses on understanding and responding to rapidly spoken English, giving individual and group presentations, responding to questions, offering a point of view in discussions, and writing academic papers. Writing skills are evaluated, and small-group and individual instruction is provided. This course is strongly recommended for students without previous experience in a U.S. classroom. The program is also valuable for all students who wish to strengthen their spoken and written English and to gain experience participating in small-group discussions.

#### Strategies for Success: An Orientation Program for New Students

The Strategies for Success program presents an opportunity for new students to orient themselves to HSPH and to Boston. The first week provides a brief, intensive introduction to the academic aspects of study at the school, including beginning and intermediate computing, exercises in the discussion method of classroom learning, and a mathematics and writing review. The program offers workshops and seminars designed to assist students in building or enhancing skills needed for success in graduate school.

The program is particularly useful for those students who have not attended U.S. colleges or universities and for those who have not recently been students. International students are strongly advised to attend the optional first week, which U.S. students are also encouraged to attend. All new students must attend the second week. A program schedule listing mandatory and optional sessions is sent to new students in August.

## Summer Academic Programs

### Summer Program in Clinical Effectiveness

The Summer Program in Clinical Effectiveness—affiliated with Brigham and Women's Hospital, Massachusetts General Hospital, and Harvard Medical School—is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Candidates must be fellows or faculty members and are usually sponsored by their clinical departments or divisions.

Students attend an intensive, seven-week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants who apply and are admitted to a degree program may apply these academic credits toward the requirements for one of two degree programs: the MPH with a concentration in clinical effectiveness and the SM in epidemiology, with an area of interest in clinical epidemiology. Qualified participants unable to attend class during the regular academic year may fulfill requirements for the SM in epidemiology or the MPH degree program by attending classes during a second or a third summer period and by completing a supervised research project.

### Summer Session for Public Health Studies

The Harvard Summer Session for Public Health Studies introduces students to the core areas of public health in two intensive sessions. Courses in the program help students develop the ability to define, assess, and evaluate the health needs of populations; to participate in the development of health policy; and to assure the delivery of health services.

Students in the Summer Session attend one or two sessions in July and August. The 2000 curriculum includes courses in biostatistics, epidemiology, health care management, health policy, ethics, environmental health, and social and behavioral science. Each course offers 2.5 credits, and the maximum recommended course load is 5 credits (two



courses) per session. Because the course work is very intensive and fast-paced, students registered for two courses in a session should not have other work commitments.

The Summer Session is intended for health professionals in training or those who are considering a midcareer change into public health and feel the need to develop their skills. Participants include public health professionals, primary care practitioners, physicians engaged in the evaluation of health care delivery and management, physicians in training (including preventive medicine residents and medical students in an MD MPH joint-degree program), and candidates for a part-time MPH program. Students accepted for admission to an HSPH degree program may choose to begin their studies early by enrolling in the Summer Session; these students will have greater flexibility in course selection during the academic year. Other students may subsequently seek admission to an HSPH degree program. Students eligible for the MPH in the quantitative methods or clinical effectiveness concentrations may apply for a summer MPH to be completed in three consecutive summers.

### Related Offerings

Clinical epidemiology area of interest, Department of Epidemiology, see page 21.

MPH concentrations in clinical effectiveness and in quantitative methods, see pages 46 and 48.

For more information about the English for Professional Communication or the Strategies for Success programs, please contact Laurel Landers, program coordinator, Office for Professional Education, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-0091

Fax: 617-432-3365

E-mail: [llanders@hsp.harvard.edu](mailto:llanders@hsp.harvard.edu)

Web: [www.hsp.harvard.edu/mph/epc](http://www.hsp.harvard.edu/mph/epc)

[www.hsp.harvard.edu/aspx](http://www.hsp.harvard.edu/aspx)

For information about the Summer Program in Clinical Effectiveness, or to request application materials, please contact Barbara Rosen, Division of General Medicine, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115.

Phone: 617-732-5648

Fax: 617-732-5344

E-mail: [brosen@bics.bwh.harvard.edu](mailto:brosen@bics.bwh.harvard.edu)

For more information about the Summer Session, please contact Hildi Keary, administrative assistant for summer programs, Registrar's and Admissions offices, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1052

Fax: 617-432-2009

E-mail: [\(specify Summer Session on subject line\)](mailto:hkeary@hsp.harvard.edu)

Web: [www.hsp.harvard.edu/summer/brochure](http://www.hsp.harvard.edu/summer/brochure)

For a brochure and a complete list of continuing education courses, please contact the Center for Continuing Professional Education, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1171

Fax: 617-432-1969

E-mail: contedu@hsph.harvard.edu

### Continuing Professional Education, Sample Courses, 2000-01

<i>Advanced Leadership Strategies for Health Care Executives</i>	<i>First Harvard Health Policy and Management Conference: Health Care in the Age of Consumerism</i>	<i>Nuclear Emergency Planning</i>
<i>Advanced Program for Chiefs of Clinical Services</i>	<i>Guidelines for Laboratory Design: Health and Safety Considerations</i>	<i>Occupational Health Physical Assessment Skills for Nurses</i>
<i>Advanced Program in Health Care Negotiation and Conflict</i>	<i>Hands-On Measurement and Diagnostics: Evaluating the Indoor Environment</i>	<i>Orientation to Indoor Air Quality</i>
<i>Analyzing Risk: Science, Assessment, and Management</i>	<i>The Harvard Conference on Strategic Alliances in Health Care</i>	<i>Program for Chiefs of Clinical Services</i>
<i>Basic CAMEO/Windows Training</i>	<i>Industrial Ergonomics: Human Factors in Occupational Health and Safety</i>	<i>Protective Clothing</i>
<i>Certified Safety Professional Review</i>	<i>Intensive Course in Health and Human Rights</i>	<i>Radioactivity in the Environment: Risk, Assessment, and Measurement</i>
<i>Comprehensive Industrial Hygiene: Practical Application of Basic Principles</i>	<i>Leadership and Management Skills Essential for Health and Safety Professionals</i>	<i>Resolution: Facilitating Integration of the Work of Multiple Contributors</i>
<i>Cost-Effectiveness Analysis for Medical Technologies and Pharmaceuticals</i>	<i>Leadership Development for Physicians in Academic Health Centers</i>	<i>The Risk Communication Challenge</i>
<i>The Eighth Guideline: Advanced Issues in Health Care Compliance</i>	<i>Measurement, Design, and Analysis for Health Outcomes Research</i>	<i>Spirometry Testing in the Workplace</i>
<i>Ergonomic Guidelines for Computer Use</i>		<i>Understanding the New World of Health Care: An Intensive Course on the Evolving Health Care System</i>
<i>Ethical Issues in International Health</i>		

### Continuing Professional Education

Organizations and technology evolve rapidly, and health professionals must continually gain new skills and perspectives. The Center for Continuing Professional Education (CCPE) creates programs to address the issues facing health professionals. Grounded in the Harvard tradition of innovative research and practice, these programs benefit participants wishing to assume and advance in positions of leadership in all fields of public health. Through a variety of formats and forums, including courses customized for and located at various organizations, CCPE provides learning opportunities that anticipate the needs of public health professionals.

Harvard faculty members lead the programs in cooperation with other experts who have earned international reputations for excellence in their fields. Participants benefit from

a wide and diverse body of knowledge and instructional venues. Through the exchange of insights and ideas between participants and instructors, programs encourage and create a dynamic and often collaborative learning environment. Many sessions use the Harvard case-study method of instruction to facilitate fast-paced, interactive problem solving, while others include hands-on laboratory sessions and demonstrations with field equipment.

Programs offer continuing medical education (CME) credit and other forms of continuing professional education credit in areas of industrial hygiene and health care licensing and credentialing. Each participant receives a certificate of attendance.

A partial list of continuing professional education courses offered during the 2000-01 academic year appears above.



## Admission & Enrollment

### Admission to Degree Programs

The admissions information in this section pertains to applications for degree programs offered by the Harvard School of Public Health (see inside front cover). As noted earlier, the PhD programs described in this catalog are offered under the auspices of the Graduate School of Arts and Sciences (GSAS). Please note that GSAS application forms and procedures are different from those used by applicants to programs administered by HSPH. The GSAS application deadline is December 15, 2000, for all PhD programs.

### Application Deadline

Applications for all HSPH doctoral (SD and DPH) and master of science (SM) programs must also be complete by December 15, 2000. Applicants to the master of public health (MPH) or master of occupational health (MOH degree) who wish to participate in the Occupational and Environmental Medicine Residency must apply by September 1, 2000.

All complete applications for the MPH and MOH programs received on or before December 15, 2000, will be considered in a priority admission cycle. The deadline for completing applications to MPH and MOH programs for review in a second cycle is February 28, 2001. It is to the candidate's advantage to meet the priority deadline, as these degree programs may fill to capacity during the priority admission cycle. Applications that arrive after February 28, 2001, and those that remain incomplete as of that date, will not be considered for admission for the 2001-02 academic year.

Participants in the Summer Clinical Effectiveness and Summer Session programs matriculating in the 2001 summer program and wishing to apply for degree candidacy must meet application deadlines outlined above.

### Application Procedures and Requirements

Only applications that are complete will be processed and reviewed for admission. For an application to be considered complete, the Admissions Office must receive the following application materials by the deadlines indicated above:

- A completed and signed application form, a resume, and a 500-word essay written by the applicant. The essay should describe the applicant's academic and professional history, area of interest at

For information about admission to the PhD Program in Biological Sciences in Public Health, please contact the Admissions Office, Graduate School of Arts and Sciences, Harvard University, 8 Garden Street, Cambridge, MA 02138. Phone: 617-495-5315

For information about admission to the PhD Program in Health Policy, please contact Joan P. Curhan, director, 79 John F. Kennedy Street, Cambridge, MA 02138. Phone: 617-496-5412

### Tuition and Fees, July 2000–June 2001

#### Tuition for full-time master's degree students and special students

(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year) \$23,980 per year

#### Tuition for part-time master's degree students, special students, and affiliates

(1-19 credits per semester, fall and spring, with a maximum of 15 summer credits. Part-time students may accrue 45 credits for the comparable full-time tuition rate.) \$ 600 per credit

#### Tuition for nonresidential master of science in health care management

\$26,000 for program

#### Tuition for full-time resident doctoral students

(20-credit minimum and 25-credit maximum per semester, fall and spring; may not exceed 45 credits per year)

Full-time, years 1 and 2	\$23,980 per year
Full-time reduced, year 3	\$11,990 per year
Facilities fee, year 4 to thesis defense	\$ 2,998 per year
Thesis defense fee (final semester before graduation)	\$ 1,280 one semester

#### Tuition for part-time resident doctoral students

Credits 1-80	\$ 600 per credit
Credits 81-120	\$ 300 per credit
Credits 121 to thesis defense	\$ 75 per credit
Thesis defense fee (final semester before graduation)	\$ 1,280 one semester
Tuition for nonresident doctoral students, full-time or part-time	\$ 1,606 per year

#### Tuition for summer session 2000

\$ 600 per credit

#### Fees

Registration fee (summer, fall, spring)	\$ 125 per semester
Late registration fee	\$ 80
Late add/drop/change fee	\$ 80 per petition
Leave of absence fee	\$ 300 per semester
Health fees (see page 57)	

Note: Tuition rates are given in 2000-01 tuition dollars. Continuing students should expect an increase.

HSPH, reasons for wanting to enroll in the degree program, and professional or academic career plans upon completion of the program.

- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the courses taken appear to be relevant to a degree in public health. Transcripts should list courses taken, grades received, and degree(s) conferred (if applicable). Each transcript must be received by the Admissions Office in an

envelope sealed and signed by the registrar of the school issuing the transcript. Applicants are expected to have a distinguished undergraduate record, as well as excellent performance in any graduate work undertaken.

- Letters of recommendation from at least three people who are well acquainted with the applicant's academic work and/or professional experience (recommendation forms are provided in the application packet).

### Health Fees, September 2000–August 2001

University Health Services (UHS) Fee	Semester	Year
Individual	\$ 372.50	\$ 745.00
Family (student plus spouse)	763.50	1,527.00
Family (student plus spouse and one child)	980.00	1,960.00

The University Health Services (UHS) provide comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, psychological counseling, and emergency services. The UHS fee is compulsory for all degree candidates and special students registered for more than 10 credits in a semester. Others may elect to waive UHS coverage; this must be done before the first day of fall registration.

Blue Cross/Blue Shield (BC/BS) Medical Insurance	Semester	Year
Individual	\$ 296.50	\$ 593.00
Family (student plus spouse)	815.50	1,631.00
Family (student plus spouse and one child)	1,186.00	2,372.00

The Blue Cross/Blue Shield (BC/BS) plan provides extensive benefits for ambulatory and inpatient care not offered at UHS. BC/BS coverage is compulsory for all nonimmigrant international students and for all other students who do not have comparable insurance. International students whose spouse and/or children will also be living in the United States are required to enroll in the family plan. U.S. students who have comparable insurance may elect to waive BC/BS coverage; this must be done before the first day of fall registration.

Note: UHS and BC/BS coverage extends from September 1 through August 31. For more information, please contact the Student Insurance Office, Harvard University Health Services, 75 Mt. Auburn Street, Cambridge, MA 02138 (phone: 617-495-2008; fax: 617-496-6125).

- Official scores of the Graduate Record Examination (GRE). Applications will not be considered without standardized test score reports. Applicants should take the GRE early enough so that score reports will be submitted by the application deadline. Although applicants are strongly recommended to submit GRE scores, the following substitutions may be permitted in the specified circumstances: physicians and currently enrolled medical students may submit Medical College Admission Test (MCAT) scores; dentists and dental students may submit Dental Admissions Test (DAT) scores; lawyers and law school students may submit Law School Admission Test (LSAT) scores; and those who hold or who are earning an MBA or a DBA from an accredited institution may submit Graduate Management Admission Test (GMAT) scores. The requirement for scores from a standardized test will not be waived on the basis of academic or professional background.

- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. Applicants (including those who have been U.S. citizens or permanent residents for less than one year) from countries where English is not the language of instruction must submit a score from the TOEFL. Applicants are advised to take the TOEFL early enough so that score reports are submitted by the application deadline; those who have already taken the TOEFL may submit the score as long as it is not more than two years old. While a minimum score of 560 on the paper-based test or 220 on the computer-based test is required for admission to a degree program, preference is given to applicants with scores closer to 600 on the paper-based test and 250 on the computer-based test, due to the demanding nature of the programs. Applicants who receive a score of 557 to 560 on the paper-based test may be reviewed for special student status for one term. (The equivalent score on the computer-based test is 220.)

Please refer to the instruction booklet that accompanies the application forms for detailed procedures and requirements.

Prospective degree candidates or special students who wish to request application materials, have questions about admission requirements, require assistance with the application process, or wish to visit the school should contact HSPH Admissions Office, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1031

Fax: 617-432-2009

E-mail: [admisofc@hsp.harvard.edu](mailto:admisofc@hsp.harvard.edu)

On-line application information and forms are available on the admissions page of the HSPH Web site.

Web: [www.hsp.harvard.edu](http://www.hsp.harvard.edu)

For information about minority student recruiting, please contact Richard Wallace, senior admissions officer, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-4175

Fax: 617-432-2009

E-mail: [rwallace@hsp.harvard.edu](mailto:rwallace@hsp.harvard.edu)

Once enrolled, students may petition to be reconsidered for admission to degree candidacy if they retake the TOEFL and earn a 560 or higher before October of the year they enter the school as a special student.

- A nonrefundable application fee of U.S. \$60, in the form of a check drawn on a bank in the United States, a postal money order, or an international money order payable to the Harvard School of Public Health.

Applicants may apply to only one degree program and must satisfy the requirements of the department or program to which they are applying. Individuals wishing to apply for a joint degree in two departments should submit a petition requesting consideration by both departments; requirements for admission to both must be satisfied. Applicants to doctoral programs must demonstrate the ability to undertake original research. All prospective students must apply for either full-time or part-time status; international students applying for an F1 visa are eligible for full-time study only.

Admission is granted for the fall semester of a particular year (currently September 2001). Students unable to enroll at that time may request a deferral but may be required to reapply. Applicants who require an early decision should adhere to the application deadlines for the year before the one in which they wish to enroll (for example, they may apply during the winter of 2000-01 for admission in September 2002).

### **Application Review**

Applicants are notified as soon as possible (in writing) about the status of their application. The Admissions Office will either confirm that an application is ready for review or will specify any missing documents. It is the responsibility of the applicant to ensure that the application is complete by the appropriate deadline. The decision of the Committee on Admissions and Degrees is final and is not subject to appeal.

For all HSPH programs the Committee on Admissions and Degrees considers the academic ability of applicants, the relevance of their previous education and experience, and their overall qualifications for graduate education in public health, including those qualities of character that reflect upon an individual's suitability to be a public health professional. In decisions about admission and financial aid, HSPH does not discriminate against individuals on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability.

### **Minority Students**

The increased participation of underrepresented groups in public health practice and research is essential to the advancement of health, and the school is committed to expanding the diversity of its faculty, staff, and student body. Members of U.S. minority groups are urged to identify themselves for special recruitment efforts by the Admissions Office.

### **Tuition Deposit and Financial Certification**

Applicants who are granted admission must submit a \$500 tuition deposit when confirming acceptance of the offer of admission.

This deposit, which is nonrefundable, will be applied toward the student's tuition and fees.

Accepted applicants who are not U.S. citizens or permanent residents must demonstrate that sufficient funds are available in U.S. currency to pay the costs (tuition, fees, living expenses, and costs associated with the English for Professional Communication program, if applicable) of the full period of their academic program. The financial certification form included in the admission packet must be completed before the certificate of eligibility form (I-20 or IAP-66) needed to obtain a visa can be issued.

International students supported by personal, family, or sponsors' funds not paid directly to Harvard University are required to deposit and retain funds adequate to cover

the appropriate tuition, fees, and living expenses for the degree program; these funds must be held in a Boston-area bank in an account bearing the student's name. An official letter stating the amount held in U.S. dollars must be sent directly by the bank to the Admissions Office for each account before the immigration forms will be completed. Students bringing their families to the United States must transfer and certify adequate funds for their support as well. (Please see page 60 for an estimate of living expenses in the Boston area.)

### **Admission to Nondegree Status**

#### **Affiliates**

Harvard faculty and staff, employees of Harvard-affiliated hospitals, HSPH alumni, and certain other Boston-area public health professionals may register for a maximum of 10 credits per semester as nondegree affiliates of the school. Affiliates must register in person at the HSPH Registrar's Office. Please call the Registrar's Office at 617-432-1032 to learn the exact dates for affiliate registration.

Enrollment of affiliate students in specific courses is subject to the availability of space and permission of the instructor and the registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment is on a per-credit basis and is due at the time of registration. Payment is not refundable unless the student is unable to take the desired course because it is filled to capacity. Affiliate students may neither audit courses nor cross-register at other Harvard schools or MIT.

#### **Special Students**

Individuals who do not fall into one of the categories listed above may apply for special student status. Applicants for special student status are subject to the same admission and registration requirements, deadlines, and procedures as applicants for degree candidacy. U.S. citizens and permanent residents may apply to the Admissions Office for full-time or part-time special student status. As noted

previously, foreign applicants are eligible for full-time status only. Admission to special student status is limited to one academic year. The deadline for applying for special student status is December 15, 2000.

#### **Subsequent Application for Degree Candidacy**

Affiliates and special students wishing to be admitted to degree candidacy must apply and will be considered on the same basis as other applicants for admission. At the time of their application, affiliates and special students who have taken courses at the school within the preceding three years may count up to 20 credits retroactively as part of the academic credit requirements. Permission may be granted if the courses fit into the applicant's academic degree program.

Applicants who have taken HSPH courses within the past three years while enrolled at another Harvard school or at MIT may petition to count up to 20 credits toward their HSPH degree only if the courses taken did not count toward another degree. The applicant must submit, at the time of his or her application, an official transcript from the other school, as well as a letter from that school's registrar stating that the courses taken at HSPH have not been counted toward another degree.

Up to 20 credits of tuition previously paid to HSPH may be counted toward the school's tuition requirement for the degree program. If an applicant is successful in petitioning to have credits taken at HSPH as a cross-registrant from another school transferred to his or her HSPH degree program, the student must pay tuition to HSPH for those credits.





## Financial Aid

### Estimated Student Expenses

This budget information is intended to provide students with an estimate of how much it will cost to spend nine months at HSPH. These figures are for the 2000-01 academic year; applicants for subsequent years should anticipate increases.

#### 2000-01 Student Expense Budget (9 months)

<b>Full-time tuition<sup>1</sup></b>		\$23,980
<b>University Health Services fee<sup>2</sup></b>	\$372.50/semester	\$ 745
<b>BC/BS health insurance fee<sup>3</sup></b>	\$296.50/semester	\$ 593
<b>Registration fee</b>	\$125/semester	\$ 250
<b>Books/supplies</b>	\$600/semester	\$ 1,200
<b>Living allowances</b>		
<b>Rent/utilities</b>	\$900/month	\$ 8,100
<b>Food</b>	\$275/month	\$ 2,475
<b>Personal</b>	\$325/month	\$ 2,925
<b>Local transportation</b>	\$55/month	\$ 495
<b>SUBTOTAL<sup>4</sup></b>		<b>\$40,763</b>
<b>Federal student loan fees<sup>5</sup></b>	3%	\$ 555
<b>TOTAL</b>		<b>\$41,318</b>

1. For part-time students, tuition charges will be assessed based upon the number of credits for which a student is registered. For 2000-01, the charge is \$600 per credit hour. Please refer to the HSPH Tuition and Fees Schedule for more information on billing procedures and payment requirements for part-time students. This is available from the HSPH Registrar's Office by calling 617-432-1032.
2. Part-time students taking 10 credits or fewer may waive the University Health Service fee if a waiver form is completed prior to registration.
3. The BC/BS health insurance fee can be waived upon proof of comparable coverage. The waiver form must be completed prior to registration. Students with a spouse and/or children may request family coverage at a fee of \$1,631 for an individual with one dependent or \$2,372 for an individual with two or more dependents.
4. International students in the 40-credit programs must be able to demonstrate support of this level (\$40,763) prior to the issuance of an I-20 or IAP-66. Other master's degree and doctoral candidates must demonstrate a 12-month support level of at least \$45,746. Students with additional family members must demonstrate the following levels of support.

9-month Student & spouse	12-month Student & spouse	9-month Student, spouse, & 1 child *	12-month Student, spouse, & 1 child *
\$45,446	\$51,907	\$48,392	\$55,763

\*For each additional child, add \$1,395 for the 9-month and \$1,680 for the 12-month budget.

5. Loan fees are based on borrowing \$18,500 in Federal Direct Loans, available to U.S. citizens and permanent residents only.

## Matriculation in Summer Programs

Students matriculating in summer programs should increase the nine-month budget according to the table below (for academic year 2000):

	English for Professional Communication Program	Summer Clinical Effectiveness Program (15 credits)	Summer Session in Public Health Studies
Tuition	\$ 775.00	\$ 9,000.00	\$1,500.00 (per 2.5-credit course)
Registration fee	N/A	\$ 125.00	\$ 125.00
Course materials/ book allowance	N/A	\$ 300.00	\$ 75.00 (per 2.5-credit course)
University Health Services fee	\$ 59.25 (1-month coverage)	\$ 118.50 (2-month coverage)	\$ 118.50 (2-month coverage)
BC/BS health insurance*	\$ 46.67 (1-month coverage)	\$ 93.34 (2-month coverage)	\$ 93.34 (2-month coverage)
Living allowances	Based on 1 month	Based on 2 months	Based on 2 months
Rent/utilities	\$ 900.00	\$ 1,800.00	\$1,800.00
Food	\$ 275.00	\$ 550.00	\$ 550.00
Personal	\$ 325.00	\$ 650.00	\$ 650.00
Transportation	\$ 55.00	\$ 110.00	\$ 110.00
<b>TOTAL</b>	<b>\$2,435.92</b>	<b>\$12,746.84</b>	<b>\$5,021.84</b>

\* Students with a spouse and/or children may request BC/BS family insurance coverage at a monthly fee of \$128.33 for an individual with one dependent or \$186.67 for an individual with two or more dependents.

Please refer to the HSPH Tuition and Fees Schedule for more information on summer tuition billing for full and part-time students.

## Sources of Financial Aid

The Office of Student Financial Services and academic departments make every effort to assist students in finding resources to finance their education at HSPH. It should be noted that the school's need-based grants are extremely limited. As such, students are urged to investigate all sources of support, including employers, government agencies, and civil and religious organizations.

Financial aid is available in the form of grants, scholarships, loans, and work programs, as follows:

### Grants and Scholarships

Some departments may have grants and departmental scholarships that may cover tuition expenses plus a stipend. Eligibility is generally based on career goals, academic merit, experience, and U.S. citizenship or permanent residency. Other grants may also be available, and eligibility for them varies according to departmental priorities. Please contact the department to which you are applying for additional information.

The university offers a number of restricted scholarships to students who meet specific criteria. Please refer to the HSPH financial aid application packet for more information. An HSPH application for financial aid is required (see below).

### Federal Student Loans

The Office of Student Financial Services administers the Federal Direct Loan and Federal Perkins Loan programs. The maximum amount a student may receive under the Direct Loan program is \$18,500 per academic year. Students with extreme financial need may also be eligible for the Perkins Loan up to \$6,000. To apply for these loan programs, you must

- be a U.S. citizen or permanent resident
- not be in default on a prior federal loan or owe a refund on a federal student grant
- be enrolled at least half-time
- complete the financial aid application process

Please refer to the instruction booklet that accompanies the financial aid application forms for additional information about loan and work programs. For more information about the financial aid application process, please contact the HSPH Office of Student Financial Services, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1867  
E-mail: [hspfao@hsph.harvard.edu](mailto:hspfao@hsph.harvard.edu)

For information about registration, billing procedures, or admission to affiliate status, please contact the HSPH Registrar's Office, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-1032  
Fax: 617-432-2009  
E-mail: [registra@hsph.harvard.edu](mailto:registra@hsph.harvard.edu)

### **Alternative Student Loans**

The Office of Student Financial Services works with lending institutions to offer credit-based educational loans to students whose educational expenses exceed the amount of the base federal loan package. These loans are the last resort a student should utilize as the interest rate and repayment terms are not so favorable as the federal programs. International students with a U.S. citizen or permanent resident co-signer may be able to utilize these programs.

### **Work Programs**

Some students may obtain part-time employment as research or teaching assistants in their academic departments. Students interested in this form of employment should contact their department. Additionally the school participates in the Federal Work-Study Program, which subsidizes between 50 percent and 75 percent of the on- or off-campus employer's costs. Eligibility for this program is the same as for federal student loans.

### **Application for Financial Aid**

To be considered for federal financial assistance programs for the 2001-02 academic year, students must complete the following steps:

1. File the 2001-02 Free Application for Federal Student Aid (FAFSA).

The FAFSA may be completed on the Web at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) or by utilizing the paper application. Students may obtain the paper version by calling the Office of Student Financial Services at 617-432-1867 or the federal financial aid information line at 1-800-433-3243 (for the hearing impaired, the number is 1-800-730-8913). Please note: the HSPH school code is E00214.

The FAFSA cannot be submitted prior to January 1, 2001. Please allow three to five weeks for processing.

2. Complete the 2001-02 HSPH application for financial aid.

This form is available on-line at our Web site, [www.hsph.harvard.edu/financial\\_aid](http://www.hsph.harvard.edu/financial_aid), or students may call the Office of Student

Financial Services at 617-432-1867 for an application. The form should be submitted to the Office of Student Financial Services by February 12, 2001. Applicants for the Harvard University restricted scholarships must also complete this form.

3. Submit a signed copy of their 2000 federal income tax return, with schedules.

Students not required to file a return must submit a nonfiler statement. Applicants must also submit a copy of their W-2 forms. If married and filing separately, applicants must submit a signed copy of their spouse's return, schedules, and W-2 forms.

Some students may be required to provide additional information. The Office of Student Financial Services will contact applicants should other documentation be required.

Once all financial aid applications have been received and students have been notified of their acceptance by the Admissions Office, the Office of Student Financial Services will be able to review of their application. Eligibility for financial assistance will be described in an award letter.

### **Registration**

Prior to registration, students receive complete course descriptions and information about course meeting times and registration procedures. Every resident degree candidate is expected to register in person on the dates specified. The fall 2000 registration date for degree students is September 11. A student who is unable to register at the designated time should write to the Registrar's Office to request late registration and will be assessed a late registration fee of \$80 per week.

Students intending to cross-register for courses in other Harvard schools or at MIT should be aware that registration deadlines and academic calendars vary from school to school; these students must conform to the registration requirements of the school into which they are cross-registering as well as those of HSPH.

In order to register, students must show that they have met any contingencies stated in their letter of admission; that they have complied with the Massachusetts state regulation concerning immunization against measles, mumps, and rubella; and, for international students, that they have presented their passports and entry permits to the Harvard International Office. Students must take appropriate action to pay their semester term bill by the due date of the bill on which the charges appear. Information about each of these prerequisites is sent to incoming students prior to their arrival at the school.

Degree candidates are subject to certain course load and tuition requirements. All degree candidates (with the exception of students on leave of absence) are expected to register each semester. Full-time students must take 40 to 45 credits during the nine-month academic year (September to May), with a minimum of 20 credits per semester. Part-time students enroll in fewer than 20 credits in a semester.

Degree candidates are required to pay full-time or equivalent tuition to the Harvard School of Public Health for a designated number of credits, depending on the length of their program (for example, a student in the MPH program must pay tuition for a minimum of 40 credits in order to receive the degree). Doctoral students who earned an HSPH master's degree within three years of beginning the doctoral program are credited with tuition paid during their master's program. The Student Handbook, distributed at registration, provides detailed information about course load and tuition requirements for degree programs. Tuition paid for enrollment at any other Harvard school or program does not count toward the HSPH residency requirement.

Incoming full-time degree candidates and special students receive a bill for fall semester tuition and fees in July and on a monthly basis thereafter. (Students matriculating as degree candidates during the summer receive a bill in May for summer tuition.) Spring semester tuition and fees are charged to the student's bill in December. Part-time tuition is assessed in July for fall semester and in

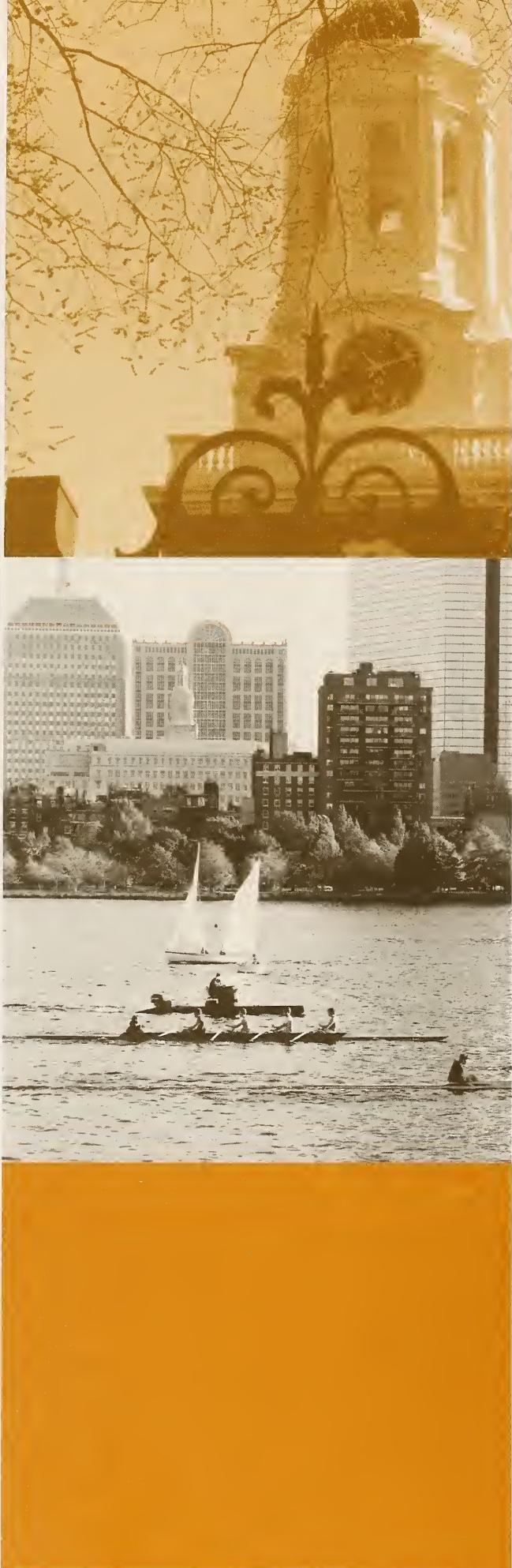
December for spring semester at 10 credits. Part-time students wishing to register for fewer than 10 credits per semester should inform the Registrar's Office prior to registration so the bill can be reduced accordingly. Students wishing to complete more than 10 (and fewer than 20) credits per semester should inform the Registrar's Office prior to registration so that the 10-credit cap can be lifted and the bill can be adjusted accordingly. Until notified otherwise, the Registrar's Office will require payment from part-time students for 10 credits prior to registration and will limit them to 10 credits.

To be eligible for federal student loans, part-time students must register for 10 or more credits per semester. As previously noted, students must register for 10 or fewer credits per semester to be eligible to waive the University Health Services fee. Students who are sponsored by a non-Harvard funding agency (for example, the World Health Organization or the U.S. military) must provide an original award letter from the sponsoring agency indicating the U.S. dollar amount awarded, the terms of payment for each year the student will be funded, and the duration of the sponsorship. Although the sponsor is billed directly at midsemester, all charges and credits appear on the student's monthly term bill. Sponsored-billing forms are available from the Registrar's Office.

Harvard faculty and staff members, Harvard alumni, affiliates (except those in summer programs), and Boston-area public health professionals enrolled in nondegree status do not receive a term bill but must pay all tuition and fees in full when they register. Payment is not refundable if the student elects to drop the course(s) for which he or she has registered.

In addition to tuition and fees, other charges that may appear on the term bill include those for course materials charges, library fines, any charges not covered by the University Health Services fee (for example, some dental and optical shop charges), and rental charges from Harvard Real Estate.





## Student Life

### Boston, Massachusetts

The Harvard School of Public Health is located in Boston, Massachusetts, a thriving center of American history, culture, commerce, and education. Boston is New England's largest and one of America's oldest cities. Its colonial past resonates in the cobblestone streets of Beacon Hill, a striking contrast to the skyscrapers of the business district. A hive of intellectual activity, the Boston area is home to more than sixty colleges and universities and a number of renowned teaching and research hospitals.

The area hosts major art museums, museums devoted to science and children, the famous Boston Symphony and Boston Pops, several professional theater companies, and five professional sports teams—the Boston Red Sox, the New England Patriots, the Boston Celtics, the New England Revolution, and the Boston Bruins. The city offers elegant shopping and diverse dining, from casual ethnic restaurants to haute cuisine. Compact in scale, Boston invites walking but also provides extensive public transportation.

The proximity of Cape Cod and Maine beaches, the mountains of Vermont and New Hampshire, and the charming villages of New England add to the appeal of Boston, one of America's most stimulating and livable cities.

### Harvard University

Founded in 1636, Harvard University is the oldest institution of higher learning in the United States. It has educated six presidents of the United States, and its faculty has produced more than thirty Nobel laureates. Today Harvard has an enrollment of more than 18,000 degree candidates, and an additional 13,000 students are enrolled in the Harvard Extension School. Including HSPH, the university has ten graduate and professional schools. Its ninety individual collections constitute the largest academic library in the world, and ten art and science museums further enrich the quality of intellectual life.

The university has campuses in both Cambridge, Massachusetts, and Boston.

## Resources and Services for HSPH Students

The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine and are near Children's Hospital Medical Center, Beth Israel Deaconess Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is within walking distance of many cultural institutions, such as Boston's Museum of Fine Arts, and public transportation is readily available to other parts of Boston and Cambridge, where students may cross-register for courses at other Harvard schools and at MIT. A shuttle bus runs between the Longwood campus and Harvard Yard in Cambridge.

### Francis A. Countway Library of Medicine

The Countway Library is the principal provider of library services to the school. In this library are the combined resources of the Harvard Medical Library and the Boston Medical Library. The Countway is one of the largest medical libraries in the country and houses over 630,000 bound volumes and 3,500 current journal titles. The library's Web site provides access to more than 500 full-text journals in the biosciences and medicine and to many electronic databases. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Students have borrowing privileges throughout the Harvard University library system. The Boston Public Library, MIT libraries, and other area libraries add to the total book and periodical resources available.

### Instructional Computing Facility

HSPH operates the Instructional Computing Facility dedicated to serving the course work and research computing needs of its students and faculty. Resources include SUN Unix computers, X-terminals, IBM personal computers, Apple Macintosh computers, a Novell network, laser printers; a wide array of software, including statistical packages, programming languages, analytical programs, and word-processing packages; services such as remote dial-in, file transfer, electronic mail, connections to the Internet and World Wide Web, user assistance, short courses, and computer accounts for funded research. Many academic departments also provide computing resources for their students. Additional services, such as computer classes, discounted hardware and software, user groups, and technical support, are available through the offices of Harvard's University Information Systems.

### Office for Students and Alumni

The Office for Students and Alumni provides support services and offers a number of educational, social, and cultural programs. These enhance the academic experience, facilitate development, encourage interaction, and help students to cope with the many demands of their academic and personal lives. Responsibilities of the Office for Students and Alumni include maintaining a liaison with the student government and other student groups and addressing particular needs and concerns, both individually and through special programming. The provision of career services, administration of the school's residential facilities, assistance to students with disabilities, and liaison to alumni are encompassed within the Office for Students and Alumni.

### Office for Alumni Programs

The Office for Alumni Programs will refer potential applicants to HSPH graduates and current students to answer questions about departments, curricula, career opportunities, and alumni activities. The Alumni Association of the Harvard School of Public Health enjoys an active membership of over 7,000



For more information about services provided by the Office for Students and Alumni and referrals to current students, please contact Robin M. Worth, assistant dean for students and alumni, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-6650

Fax: 617-432-3879

E-mail: [rworth@hspf.harvard.edu](mailto:rworth@hspf.harvard.edu)

For more information about alumni activities and referrals to alumni, please contact Sudha Kotha, director of alumni programs, 677 Huntington Avenue, Boston, MA 02115.

Phone: 617-432-2401

Fax: 617-432-3184

E-mail: [skotha@hspf.harvard.edu](mailto:skotha@hspf.harvard.edu)



**For more information about career services, please contact Peter Crudele, director of career services, 677 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-1034  
**Fax:** 617-432-3184  
**Web:** [www.hsph.harvard.edu/Admins/offstuds/career.html](http://www.hsph.harvard.edu/Admins/offstuds/career.html)

**For more information about Shattuck House, housing alternatives, or services for disabled students, please contact the Office for Students and Alumni, 677 Huntington Avenue, Boston, MA 02115.**  
**Phone:** 617-432-1035  
**Fax:** 617-432-3184  
**Web:** [www.hsph.harvard.edu/housing/](http://www.hsph.harvard.edu/housing/)

graduates worldwide. The association is governed by an elected council of twelve members who meet four times a year. With the assistance of the Office for Alumni Programs, regional gatherings of alumni are often organized in the United States and abroad by members of the association.

#### ***Office for Career Services***

The Office for Career Services provides career counseling, employment resources, and networking opportunities to assist students and alumni in expanding their employment prospects. The office sponsors workshops on job-seeking strategies, interviewing skills, and resume and cover-letter writing, as well as panel discussions featuring public health professionals speaking about market trends and career paths. In the Career Resource Center students have access to listings of current job openings, information about fellowships and internships, and resource directories. The office also maintains a Web site, which provides links to additional career and employment resources.

#### ***Student Housing***

The Henry Lee Shattuck International House is operated by the school on a nonprofit basis for its full-time students and their families from the United States and abroad.

Located within a ten-minute walking distance of the school, this newly renovated apartment complex consists of three buildings with 70 furnished apartments of various sizes to accommodate single students, roommates, and families. Several apartments are wheelchair accessible. All apartments have a private kitchen and bath, free Internet and E-mail access via a data link to the school, two telephone lines, and interior cable access. Shared facilities include a computer room with fax and copy machines, a library, an exercise room, function rooms, a children's playroom, a laundry room, an indoor bicycle storage area, and a playground.

Demand for the apartments exceeds their availability, so apartments are assigned by lottery within certain categories. The Office for Students and Alumni holds a lottery in late May, and applicants are notified of the results in early June. A waiting list will be maintained by the office throughout the summer and fall for applicants who are not assigned an apartment during the initial process.

Applicants are assigned to particular categories based on the following guidelines: (1) new HSPH students are given priority; (2) generally 70 percent of the available apartments are reserved for international students, and 30 percent are rented to U.S. and Canadian students, with priority given to those coming from outside the New England and surrounding areas; (3) the type of apartment (e.g., studio, one-bedroom) desired. The maximum length of residency is two years, assuming residents maintain the status of full-time students. A partial year of residency counts as an entire year.

#### ***Students with Disabilities***

The Office for Students and Alumni also furnishes a range of services to disabled students, including interpreters, tape recordings of class readings, arrangements for appropriate accommodations and transportation, and special academic services as necessary.

### Child Care Facilities

There are a number of child care facilities available to students on the Longwood and Cambridge campuses. Referrals and information are provided by the Harvard University Office of Work and Family and the Office of Work and Family at the Medical School. Arrangements should be made as early as possible, as facilities are quickly filled.

### International Students

During the 1999–2000 academic year, approximately 30 percent of HSPH students were foreign citizens, representing 37 countries. The experience international students bring to the school lends an important dimension to the academic program and adds to the diversity of the student population. International students organize many cultural events at the school, such as celebrations of the lunar New Year, and participate in the annual International Night talent show.

The Office for Students and Alumni assists foreign students in adjusting to life in the United States. The office sponsors ESL classes, hosts Global Chat (a weekly lunchtime meeting that gives students an opportunity to practice their English while learning about each other's native country), and organizes social events and local excursions. Staff members in the Office for Students and Alumni are available to meet with students to discuss personal or academic problems and to assist students and their families who have questions about living in Boston and the United States.

The Harvard International Office, located on the Cambridge campus, also provides a variety of services to students from abroad, including orientations, newsletters, and cross-cultural workshops. One program, the Friends of International Students, matches students with a person or family who will welcome them and ease their transition to the United States. Foreign student advisers from the Harvard International Office hold weekly office hours at HSPH to assist students with visa matters and to advise them on immigration regulations.

### Student Organizations

The Student Coordinating Committee (SCC) includes elected representatives from each department, from the master of public health program, and from the Division of Biological Sciences. The SCC meets regularly to discuss issues and plan activities related to student life at HSPH and provides a mechanism for working with members of the school's faculty and administration on schoolwide issues, for sponsoring seminars and other educational programs, for organizing social activities, and for arranging for student representation on several of the school's faculty committees. The SCC frequently sponsors or cosponsors collaborative activities with the school and the neighboring community, including tutoring programs, toy drives, and an annual dinner-dance for senior citizens.

The HSPH Minority Student Health Organization (MSHO) plays a leading role in presenting programs on public health issues concerning underserved populations. Ñ-The Spanish Speaking Committee takes up issues of importance to that constituency. The Asian Club promotes both cultural activities at HSPH and Asian student involvement in the community. Students of the African Diaspora, the school's newest organization, represents the interests of black students at HSPH.

The Multicultural Student Alliance (MSA) brings together minority students from throughout Harvard's Longwood campus, which includes the medical, dental, and public health schools. MSA comprises several organizations, including the Black Health Organization, Medical Students of Las Americas, Meeting of Students Addressing Intercultural Concerns (MOSAIC), Native American Health Organization, Student National Medical Association, and Student National Dental Association.

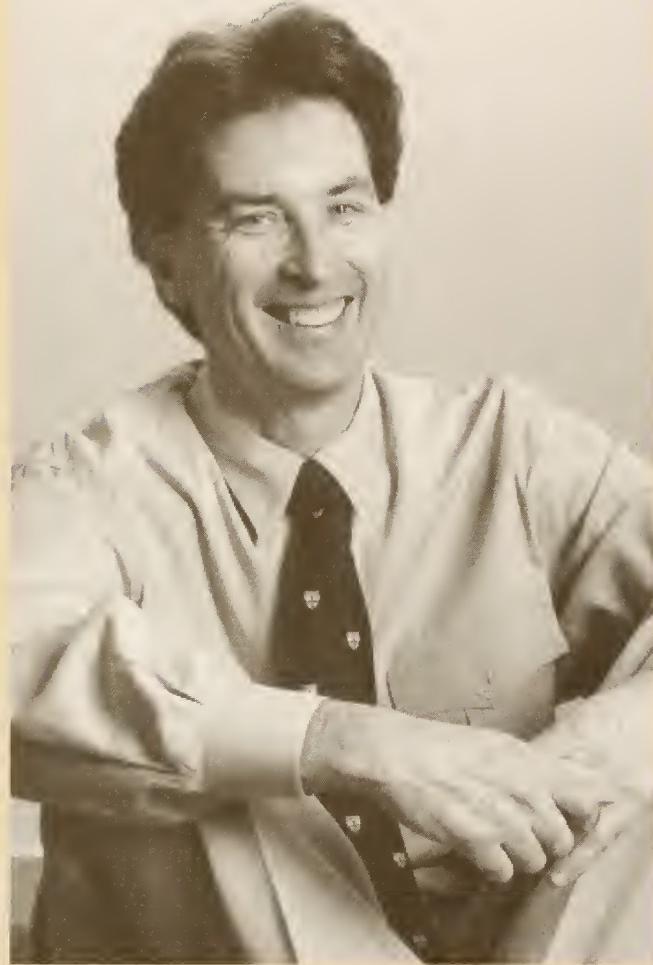
Other student organizations include the Health and Human Rights Committee; Women in Public Health; the Longwood Players; and the Lesbian, Gay, Bisexual, and Transgender Alliance.

For more information about child care centers in the area, please contact the Office of Work and Family at 617-495-4100; co-managers are Judy Walker and Cindy White. The Medical Center Office of Work and Family at 617-432-1615 can also provide information on support services, resources, and programs.

For more information about services offered by the Harvard University International Office, please contact the Adviser to Foreign Students and Scholars, Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138.

Phone: 617-495-2789

Fax: 617-495-4088



## Faculty of the Harvard School of Public Health

### Department of Biostatistics

**Department chair:** Stephen W. Lagakos, MPhil, PhD (George Washington University); Henry Pickering Walcott professor of biostatistics and scientific director of the Center for Biostatistics in AIDS Research. Statistical methods arising in AIDS research; clinical trials.

**Sudeshna Adak, MS** (Indian Statistical Institute), PhD (Stanford University); assistant professor of biostatistics. Spectral analysis of nonstationary time series; time-varying ARMA modeling; generalized linear models.

**Rebecca A. Betensky, PhD** (Stanford University); associate professor of biostatistics. Sequential analysis; correlated binary data.

**Marco Bonetti, MS, PhD** (University of Connecticut); assistant professor of biostatistics. Analysis of clinical trial data; analysis of growth data; stochastic geometry and applications to disease spatial clustering.

**Paul J. Catalano, SD** (Harvard University); associate professor of biostatistics. Repeated measures; multivariate models; dose-response modeling; risk assessment; environmental statistics.

**Brent A. Coull, MS, PhD** (University of Florida); assistant professor of biostatistics. Categorical data analysis; generalized linear mixed models; generalized additive models; capture-recapture methodology; methods for exact categorical inference.

**Victor G. De Gruttola, SM, SM, SD** (Harvard University); professor of biostatistics. Methods for analysis of repeated measures from longitudinal studies; methods for epidemiological analysis of AIDS.

**Garrett Fitzmaurice, MSc** (University of London), MA (National University of Ireland), SD (Harvard University); associate professor of biostatistics. Likelihood-based and nonlikelihood approaches to analyzing multivariate binary outcomes; methods for analyzing mixed discrete and continuous outcomes.

**Robert C. Gentleman, MSc, PhD** (University of Washington); associate professor of biostatistics. Statistical computing and the analysis of censored data.

**Peter B. Gilbert, MS, PhD** (University of Washington); assistant professor of biostatistics. Statistical methods for HIV and AIDS; survival analysis; efficient estimation in semiparametric models; multinomial logistic regression models; biased sampling models.

**Robert J. Gray, SM, PhD** (Oregon State University); senior lecturer on biostatistics. Clinical trials; survival analysis; techniques for exploratory data analysis and model building.

**David P. Harrington, AM, PhD** (University of Maryland); professor of biostatistics. Nonparametric methods for censored data; sequential designs for clinical trials.

**Wenzheng Huang, ME, PhD** (Johns Hopkins University); assistant professor of biostatistics. Generalized linear models and survival analysis.

**Michael D. Hughes, MSc, PhD** (University of London); associate professor of biostatistics. Statistical methods in the design, analysis, and reporting of clinical trials and overviews.

**Joseph G. Ibrahim, MS, PhD** (University of Minnesota); associate professor of biostatistics. Generalized linear models; Bayesian inferences.

**Nan M. Laird, PhD** (Harvard University); professor of biostatistics. Longitudinal studies; nonresponse and missing data methods; discrete data analysis; Bayesian methods; meta-analysis.

**Yi Li, MS** (Tulane University), MS, PhD (University of Michigan); assistant professor of biostatistics. Survival analysis; longitudinal and spatial data analysis.

**Kathryn L. Lunetta, MS, PhD** (University of Michigan); assistant professor of biostatistics. Statistical issues in human genetics and methodology for mapping genetic markers.

**Donna S. Neuberg, MA** (University of Chicago), MA (State University of New York at Stony Brook), SD (Harvard University); senior lecturer on biostatistics. Cancer clinical trials; genetic epidemiology.

**Marcello Pagano, SM** (University of Florida), PhD (Johns Hopkins University); professor of statistical computing. Statistical computing; clinical trials; epidemic modeling.

**James M. Robins, MD** (Washington University); professor of epidemiology and biostatistics. Development of analytic methods for drawing causal inferences from complex observational and randomized studies with time-varying exposures or treatments.

**Andrea G. Rotnitzky, MA, PhD** (University of California, Berkeley); senior lecturer on biostatistics. Longitudinal data analysis; analysis of repeated categorical data and cluster correlated data. (On leave 9/1/00–6/30/01)

**Louise M. Ryan, PhD** (Harvard University); professor of biostatistics. Rodent tumorigenicity experiments; teratology experiments; clinical trials; goodness-of-fit tests; survival analysis.

**Donna L. Spiegelman, SM, SD** (Harvard University); associate professor of epidemiology and biostatistics. Binary data models with measurement error and misclassification in model covariates.

**Kenneth E. Stanley, MA** (Bucknell University), PhD (University of Florida); lecturer on biostatistics. Estimating mortality attributable to tobacco in the presence of incomplete information.

**Marcia A. Testa, MPH, MPhil, PhD** (Yale University); senior lecturer on biostatistics. Design, methodology, measurement, and analytical techniques for evaluation of quality-of-life indices in therapeutic clinical trials; design and structure of clinical database information management systems.

**Florin Vaida, PhD** (University of Chicago); assistant professor of biostatistics. Markov chain Monte Carlo; likelihood inference; nonparametric modeling; longitudinal data.

**Matthew P. Wand**, PhD (Australian National University); associate professor of biostatistics. Nonparametric curve estimation; Markov chain Monte Carlo; computational statistics.

**Yougan Wang**, MS (Peking University), PhD (University of Oxford); assistant professor of biostatistics. Sequential clinical and screening trials; quasi-likelihood; estimating functions and asymptotic inference; overdispersion in analysis of longitudinal data; resampling methods.

**James H. Ware**, PhD (Stanford University); Frederick Mosteller professor of biostatistics and dean for academic affairs. Design and analysis of longitudinal studies; statistical aspects of environmental health research.

**Lee-Jen Wei**, PhD (University of Wisconsin); professor of biostatistics. Design and analysis of clinical trials; repeated measurements analysis; survival analysis.

**Milton C. Weinstein**, AM, MPP, PhD (Harvard University); Henry J. Kaiser professor of health policy and management (Health Policy and Management and Biostatistics); professor of medicine, Harvard Medical School. Cost-effectiveness of health practices and technologies.

**Paige L. Williams**, BSPH, PhD (University of North Carolina); associate professor of biostatistics. Cancer risk assessment and other areas of environmental statistics, especially animal carcinogenicity bioassays.

**Wing Hung Wong**, MS, MS, PhD (University of Wisconsin); professor of computational biology. Bayesian computation; theoretical statistics; high-dimensional molecular biology and genetics.

**David Wypij**, ScM (Brown University), MS, PhD (Cornell University); associate professor of biostatistics. Longitudinal data analysis; repeated measures and growth curve models; discrete data.

**Ronghui (Lily) Xu**, MA, PhD (University of California, San Diego); assistant professor of biostatistics. Survival analysis, particularly in relation to proportional hazards models; goodness-of-fit.

**Marvin Zelen**, AM (University of North Carolina), PhD (American University); professor of statistical science; member of the Faculty of Arts

and Sciences. Theory and practice of clinical trials; methodology for early detection of disease.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.*

**Roger B. Davis**, MA (University of Rochester), SD (Harvard University); associate professor in the Department of Biostatistics. Design and analysis of clinical trials; recursive partitioning methods.

**Kimberlee Gauvreau**, SM, SD (Harvard University); assistant professor in the Department of Biostatistics. Biostatistical issues in clinical studies in the field of pediatric cardiology; institutional variability in outcomes following surgery for congenital heart disease; postoperative course of patients undergoing repair of a single functional ventricle.

**Richard D. Gelber**, SM (Stanford University), PhD (Cornell University); professor in the Department of Biostatistics. Design and analysis of clinical trials.

**Rebecca S. Gelman**, PhD (State University of New York at Buffalo); associate professor in the Department of Biostatistics. Clinical trials; disease screening; survival methods.

**Robert J. Glynn**, MA (Boston College), PhD (Brandeis University), SM, SD (Harvard University); associate professor in the Department of Biostatistics. Analysis of longitudinal data; nonresponse in sample surveys; epidemiology of eye diseases.

**Mei-Ling Ting Lee**, MS (National Tsing-Hua University), MA, PhD (University of Pittsburgh); assistant professor in the Department of Biostatistics. Lifetime data analysis; categorical data analysis.

**Sharon-Lise T. Normand**, MSc (University of Western Ontario), PhD (University of Toronto); associate professor in the Department of Biostatistics. Bayesian inference; graphical models; meta-analysis.

**E. John Orav**, PhD (Stanford University); associate professor in the Department of Biostatistics. Statistical computing and simulation; stochastic modeling; bioassay.

**Bernard A. Rosner**, MA (Stanford University), PhD (Harvard University); professor in the Department of Biostatistics. Analysis of clustered binary data; longitudinal data analysis.

**David A. Schoenfeld**, AM, PhD (University of Oregon); professor in the Department of Biostatistics. Statistics in medical research; linear models; bioassay; survival theory.

**Grace Wyshak**, SM (Harvard University), PhD (Yale University); associate professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods; women's reproductive health.

#### Adjunct Faculty

**Cyrus R. Mehta**, SM, PhD; president, Cytel Software Corporation.

**DeJuran Richardson**, MS, PhD; associate professor of mathematics, Lake Forest College.

**Nicholas J. Schork**, MA, MA, PhD; associate professor, Department of Genetics, Case Western Reserve University.

**Michael A. Stoto**, PhD; professor and chair, Department of Epidemiology and Biostatistics, George Washington University.

#### Department of Cancer Cell Biology

**Department chair:** **John B. Little**, MD (Boston University); James Stevens Simmons professor of radiobiology and director of the John B. Little Center for Radiation Sciences and Environmental Health. Radiation biology and experimental carcinogenesis; cellular studies of transformation, mutagenesis, and cytogenetic damage in vitro; molecular mechanisms of mutagenesis and oncogene expression; genetic susceptibility to cancer in human populations.

**Bruce Demple**, PhD (University of California, Berkeley); professor of toxicology. Repair enzymes for oxidative DNA damage; molecular biology of cellular responses to oxidative stress.

**Karl T. Kelsey**, MD (University of Minnesota), MOH (Harvard University); professor of environmental health and cancer biology. Occupational and environmental carcinogenesis, with emphasis on the study of workplace mutagen and carcinogen exposure, using epidemiological application of cytogenetic and molecular endpoints.

**Carl G. Maki**, PhD (Kansas State University); assistant professor of radiobiology. Cancer biology; radiation research; DNA repair; cell-cycle regulation.

**Leona D. Samson**, PhD (University of London); professor of toxicology. Cell response to DNA damage at the biological, biochemical, and genetic levels; mechanisms of mutagenesis and cell killing.

**Robert H. Schiestl**, PhD (University of Vienna); associate professor of toxicology. Mechanisms of DNA repair and recombination with relevance to carcinogenesis and gene targeting, examined through studies carried out in the yeast *Saccharomyces cerevisiae* in human and mouse cells and in transgenic animals.

**Dieter Wolf**, MD (University of Munich); assistant professor of toxicology. Maintenance of normal genome copy through replication control and genetic identification of conserved components; role of proteolysis in replication control.

**Zhi-Min Yuan**, MD (Jiangxi Medical College), PhD (University of Maryland); assistant professor of radiobiology. Cancer biology; radiation research; cell-cycle regulation; signaling pathways.

*The following faculty member has a secondary appointment at HSPH. His primary affiliation is with Harvard Medical School.*

**Howard L. Liber**, PhD (Massachusetts Institute of Technology); associate professor in the Department of Cancer Cell Biology. Development and utilization of cellular and molecular methods to investigate mutagenesis in human cells, from both mechanistic and environmental perspectives.

#### Adjunct Faculty

**Peter Ofner**, MRSC, PhD; associate professor, Department of Pharmacology and Experimental Therapeutics, Tufts University School of Medicine.

**Robert Schlegel**, MPH, PhD; manager, Corning Division, Ciba/Chiron Corporation.

## Department of Environmental Health

**Department chair:** Joseph D. Brain, SM, SM, SD (Harvard University); Cecil K. and Philip Drinker professor of environmental physiology and director of the Kresge Center for Environmental Health. Function and structure of pulmonary macrophages; deposition and clearance of inhaled particles and responses to them; respiratory infection.

**Harriet A. Burge,** MA (San Francisco State University), PhD (University of Michigan); associate professor of environmental microbiology. Aerobiology; bioaerosols in indoor air; fungus allergen ecology, characterization, prevalence, and health effects.

**James P. Butler,** AM, PhD (Harvard University); senior lecturer on physiology. Lung structure and function; parenchymal micromechanics; magnetic twisting cytometry; nemoendocrinology; avian physiology.

**David C. Christiani,** MD (Tufts University), SM, MPH (Harvard University); professor of occupational medicine and epidemiology and director of the Harvard Education and Research Center for Occupational Safety and Health; professor of medicine, Harvard Medical School. Occupational diseases; biomarkers and molecular epidemiology.

**Jack T. Dennerlein,** SM (Massachusetts Institute of Technology), PhD (University of California, Berkeley); assistant professor of ergonomics and safety. Work-related chronic musculoskeletal disorders; design of human-machine interfaces.

**Douglas W. Dockery,** SM (Massachusetts Institute of Technology), SM, SD (Harvard University); professor of environmental epidemiology; associate professor of medicine (epidemiology), Harvard Medical School. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

**John S. Evans,** SM (University of Michigan), SM, SD (Harvard University); senior lecturer on environmental science. Assessment of human exposures to pollutants; evaluation of uncertainty; application of decision analysis; assessment of health risk from waste disposal and energy production.

**Timothy E. Ford,** PhD (University of Wales); associate professor of environmental microbiology. Surface, source, and drinking-water microbiology; microbial cycling/transformation of pollutants; microbiologically influenced corrosion; groundwater-surface water interactions; aerosolization of microorganisms and microbial products.

**Jeffrey J. Fredberg,** SMME, ME, PhD (Massachusetts Institute of Technology); professor of bioengineering and physiology; associate professor of pediatrics, Harvard Medical School. Identification of the mechanical basis of airway and lung parenchymal function at the levels of organ, tissue, cell, and protein.

**Beatriz S. González-Flecha,** MS, PhD (University of Buenos Aires); Mark and Catherine Winkler assistant professor of molecular biology and environmental health. Biochemistry of oxygen free radicals; oxidative stress in biological systems; mechanisms of oxidative damage in eukaryotic and prokaryotic cells; intracellular sources of oxygen free radicals and adaptive responses to oxidative stress.

**Joseph J. Harrington,** AM, PhD (Harvard University); professor of environmental health engineering (Environmental Health and Population and International Health); Gordon McKay professor of environmental engineering, Faculty of Arts and Sciences. Water resources planning and quality management; environmental monitoring and control systems; applied statistics for modeling; management for tropical disease control.

**Russ B. Hauser,** MD (Albert Einstein College of Medicine), MPH, SD (Harvard University); assistant professor of occupational medicine. Occupational lung diseases; environmental agents and allergic airways disease; male reproductive epidemiology.

**Robert F. Herrick,** MS (University of Michigan), SD (Harvard University); lecturer on industrial hygiene. Exposure-reactive aerosols; characterization of complex exposures; interaction of individuals with a source of exposure.

**Howard Hu,** MD (Albert Einstein College of Medicine), MPH, SM, SD (Harvard University); associate professor of occupational medicine. Epidemiology of chronic lead toxicity using biomarkers of bone lead accumulation and genetic susceptibility.

**Karl T. Kelsey,** MD (University of Minnesota), MOH (Harvard University); professor of environmental health and cancer biology. Occupational and environmental carcinogenesis, with emphasis on the study of workplace mutagen and carcinogen exposure, using epidemiological application of cytogenetic and molecular endpoints.

**Petros Koutrakis,** MS, PhD (University of Paris); professor of environmental sciences. Sampling and analysis of air pollutants; atmospheric, indoor air, and aerosol chemistry; application of multivariate techniques to source apportionment; acid rain; urban air pollution.

**Joseph P. Mizgerd,** SD (Harvard University); assistant professor of physiology and cell biology. Physiology of inflammation, particularly the molecular mechanisms regulating the emigration of neutrophils.

**Richard R. Monson,** MD, SM, SD (Harvard University); professor of epidemiology (Environmental Health and Epidemiology) and associate dean for professional education. Relationship between the workplace, the environment, and disease.

**Joseph D. Paulauskis,** MS, PhD (Miami University); associate professor of molecular biology. Molecular/biochemical mechanisms of toxicity for environmentally relevant contaminants; gene regulation during pulmonary inflammation.

**Stephen N. Rudnick,** MS (University of Pennsylvania), SM, SD (Harvard University); lecturer on industrial hygiene engineering. Engineering control of particulate air contaminants in indoor and occupational settings and engineering control systems; sampling and analysis of air contaminants.

**Joel D. Schwartz,** PhD (Brandeis University); associate professor of environmental health. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; nonclassical time series analysis; nonparametric smoothing and graphical methods in epidemiology.

**Jacob Shapiro,** SM (Brown University), PhD (University of Rochester); lecturer on biophysics in environmental health. Occupational and environmental radiation protection; low-level radioactive waste disposal;

radiation dosimetry and protection standards; environmental radiation surveillance.

**James P. Shine,** PhD (University of Massachusetts); assistant professor of aquatic chemistry. Distribution, fate, and effects of contaminants in aquatic ecosystems; influence of environmental variables on routes of exposure to toxic substances; effects on human and ecological health.

**Stephanie A. Shore,** PhD (McGill University); associate professor of physiology. Airway physiology and pharmacology; role of neuropeptides in the pathogenesis of airway disease.

**Thomas J. Smith,** MPH, MS, PhD (University of Minnesota); professor of industrial hygiene. Evaluation of exposure-response relationships through occupational epidemiologic studies; application of pharmacokinetic modeling to study exposure-tissue dose relationships; lab and field simulations to characterize exposure determinants. (On leave 9/1/00-1/31/01)

**Stover H. Snook,** AM (Fordham University), PhD (Tufts University); lecturer on ergonomics. Low-back pain; manual materials handling; heat stress; fatigue; stairway design; personal protective equipment; cumulative trauma disorders.

**Frank E. Speizer,** MD (Stanford University); professor of environmental science; professor of medicine, Harvard Medical School. Environmental epidemiology; pulmonary diseases; cancer and nutrition; health effects of air pollution; occupational and environmental medicine.

**John D. Spengler,** PhD (State University of New York at Albany), SM (Harvard University); Akira Yamaguchi professor of environmental health and human habitation. Assessment of human exposures to environmental contaminants; application of advanced particle analysis techniques to identify source contributions to indoor and ambient aerosols; building-related illnesses.

**Helen H. Suh,** SM, SD (Harvard University); assistant professor of environmental chemistry and exposure assessment. Multimedia exposure assessment; exposure modeling; ambient and indoor air pollution; study design.

**Ning Wang, MS** (Huazhong University of Science and Technology), SD (Harvard University); associate professor of physiology and cell biology. Cytoskeletal mechanics; mechanochemical signal transduction; cell adhesion and migration; cancer metastasis; effects of mechanical forces on cells.

**Xiping Xu, MD** (Anhui Medical University), PhD (University of Tsukuba), SM (Harvard University); associate professor of occupational epidemiology (Environmental Health and Epidemiology); associate professor of medicine, Harvard Medical School. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.

**Robert B. Banzett, PhD** (University of California, Davis); associate professor in the Department of Environmental Health. Respiratory neurophysiology and mechanics; perceived sensation; control; interaction with locomotion; fluid dynamics in the avian lung.

**Jeffrey M. Drazen, MD** (Harvard University); professor in the Department of Environmental Health. Pulmonary and respiratory pharmacology; mediators of immediate hypersensitivity; mucus regulation and expression in chronic bronchitis.

**John J. Godleski, MD** (University of Pittsburgh); associate professor in the Department of Environmental Health. Experimental models of normal and pathologic responses to inhaled particles.

**Diane R. Gold, MD** (University of Connecticut), DTM&H (University of Liverpool), MPH (Harvard University); assistant professor in the Department of Environmental Health. Acute lower-respiratory illness in childhood as a predictor of lung function and chronic respiratory symptoms; the relationship between indoor/outdoor air pollution and childhood respiratory morbidity; socioeconomic and environmental predictors of asthma prevalence and severity.

**Rose H. Goldman, MD** (Yale University), MPH, SM (Harvard University); assistant professor in the Department of Environmental Health.

Occupational health in the biotechnology industry; metal poisoning; neurotoxicity; cumulative trauma injuries.

**Stefanos N. Kales, MD, MPH** (Harvard University); assistant professor in the Department of Environmental Health. Occupational/environmental lung disease; occupational/environmental toxicology.

**Jeffrey N. Katz, SM** (Harvard University), MD (Yale University); associate professor in the Department of Environmental Health. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

**Lester Kobzik, MD** (Tufts University); associate professor in the Department of Environmental Health. Lung macrophage phagocytosis and response to inhaled particles; pulmonary inflammation and pathology.

**Stephen H. Loring, BMS** (Dartmouth Medical School), MD (Harvard University); associate professor in the Department of Environmental Health. Chest-wall mechanics, hyperinflation, and lung transplantation; mechanics and physiology of respiratory muscles and the pleural space.

**George P. Topulos, MD** (University of Massachusetts); assistant professor in the Department of Environmental Health. Pulmonary micromechanics and pulmonary circulation.

**Richard Verrier, PhD** (University of Virginia); associate professor in the Department of Environmental Health. Neural triggers of sudden cardiac death; cardiac electrophysiology; T-wave alternans; coronary hemodynamic function; novel delivery systems for anti-arrhythmic therapy.

**Scott T. Weiss, MD** (Case Western Reserve University), SM (Harvard University); professor in the Department of Environmental Health. Natural history of chronic lung disease; epidemiology of asthma and hypertension; cardiovascular, occupational, environmental, and genetic epidemiology; the effect of aging on pulmonary function.

#### Adjunct Faculty

**Ellen A. Eisen, SM, SM, SD**; professor of work environment, University of Massachusetts, Lowell.

**Alan Eschenroeder, BME, PhD**; private consultant.

**Rokho Kim, MD, MPH, DPH, PhD**; assistant professor, Seoul National University.

**Nancy C. Long, PhD**; assistant professor, Division of Science and Mathematics, Boston University College of General Studies.

**Lucas M. Neas, MSE, SD**; health scientist, U.S. Environmental Protection Agency.

**Robert B. Pojasek, PhD**; senior scientist and senior program manager, Cambridge Environmental, Inc.

**P. Barry Ryan, SM, PhD**; professor of environmental health, Emory University.

**David H. Wegman, MD, SM**; professor and chair, Department of Work Environment, University of Massachusetts, Lowell.

**Yukio Yanagisawa, MEng, DEng**; professor, Tokyo University, and chief researcher, Research Institute for Innovative Technology on Earth.

#### Department of Epidemiology

Department chair: **Meir J. Stampfer, MD** (New York University), MPH, DPH (Harvard University); professor of epidemiology and nutrition. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

**Alberto Ascherio, MD** (University of Milan), diploma (London School of Hygiene and Tropical Medicine), MPH, DPH (Harvard University); associate professor of nutrition and epidemiology. Relation of dietary factors to the occurrence of human disease.

**Lisa F. Berkman, MS, PhD** (University of California, Berkeley); Florence Sprague Norman and Laura Smart Norman professor of health and social behavior and of epidemiology. Social epidemiology; epidemiology of aging.

**Stephen L. Buka, SM, SM, SD** (Harvard University); associate professor of maternal and child health and epidemiology. Causes and prevention of behavioral and developmental disorders of children.

**Kin-Wei Arnold Chan, MD** (National Taiwan University), MPH, SD (Harvard University); assistant professor of epidemiology. Outcomes research on pharmaceutical agents in natu-

ralistic settings, including cost-effectiveness analysis, quality-of-life assessment, premarketing economic evaluation of potential products, and postmarket surveillance of adverse events; epidemiology of rheumatic diseases.

**David C. Christiani, MD** (Tufts University), SM, MPH (Harvard University); professor of occupational medicine and epidemiology and director of the Harvard Education and Research Center for Occupational Safety and Health; professor of medicine, Harvard Medical School. Occupational diseases; biomarkers and molecular epidemiology.

**E. Francis Cook, MA** (University of Massachusetts), SM, SD (Harvard University); professor of epidemiology. Epidemiologic methods; clinical epidemiology.

**Wafaie W. Fawzi, MB, BS** (University of Khartoum), MPH, SM, DPH (Harvard University); assistant professor of international nutrition and epidemiology. Etiologies of infectious diseases with emphasis on dietary and nutritional causes; relationships of dietary factors to disease in pregnancy and childhood.

**Susan E. Hankinson, MS, MPH** (University of Minnesota), SD (Harvard University); assistant professor of epidemiology. Relationships between hormonal factors and risk of breast and ovarian cancers.

**David J. Hunter, MB, BS** (University of Sydney), MPH, SD (Harvard University); professor of epidemiology and director of the Harvard Center for Cancer Prevention. Cancer epidemiology; molecular epidemiology.

**Camara P. Jones, MD** (Stanford University), PhD (Johns Hopkins University); assistant professor of health and social behavior and epidemiology. Development and application of epidemiologic methods to explore social stresses associated with racism.

**Frederick P. Li, MD** (University of Rochester), MA (Georgetown University); professor of clinical cancer epidemiology; professor of medicine, Harvard Medical School. Inherited susceptibility to cancer; clinical and molecular epidemiology.

**Marc Lipsitch, DPhil** (University of Oxford); assistant professor of epidemiology. Theoretical, statistical, and experimental approaches to population biology and the epidemiology of infectious diseases.

**Richard R. Monson, MD, SM, SD** (Harvard University); professor of epidemiology (Environmental Health and Epidemiology) and associate dean for professional education. Relationship between the workplace, the environment, and disease.

**Nancy E. Mueller, SM, SD** (Harvard University); professor of epidemiology. The role of viruses in the etiology of cancer; cancer epidemiology.

**Eric B. Rimm, SD** (Harvard University); associate professor of epidemiology and nutrition. Relation of dietary factors to the occurrence of human diseases, in particular cardiovascular disease.

**James M. Robins, MD** (Washington University); professor of epidemiology and biostatistics. Development of analytic methods for drawing causal inferences from complex observational and randomized studies with time-varying exposures or treatments.

**George R. Seage III, MPH, DSc** (Boston University); associate professor of epidemiology. HIV epidemiology; determining the clinical outcomes of HIV patients.

**Donna L. Spiegelman, SM, SD** (Harvard University); associate professor of epidemiology and biostatistics. Binary data models with measurement error and misclassification in model covariates.

**Sherri O. Stuver, SD** (Harvard University); assistant professor of cancer epidemiology. Cancer epidemiology; virus-associated disease.

**Dimitrios V. Trichopoulos, MD** (University of Athens), SM (Harvard University); Vincent L. Gregory professor of cancer prevention and professor of epidemiology. Cancer epidemiology.

**Alexander M. Walker, MD, MPH, DPH** (Harvard University); Henry Pickering Walcott professor of epidemiology. Pharmacoepidemiology; study design for observational research.

**Walter C. Willett, MD** (University of Michigan), MPH, DPH (Harvard University); Fredrick John Stare professor of epidemiology and nutrition; professor of medicine, Harvard Medical School. Relation of dietary factors to the occurrence of human disease, in particular heart disease and cancer. (On leave 9/1/00-12/31/00)

**Xiping Xu, MD** (Anhui Medical University), PhD (University of Tsukuba), SM (Harvard University); associate professor of occupational epidemiology (Environmental Health and Epidemiology); associate professor of medicine, Harvard Medical School. Environmental, occupational, and genetic epidemiology of respiratory, cardiovascular, and metabolic diseases.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School unless otherwise indicated.*

**Deborah Blacker, MD, SD** (Harvard University); assistant professor in the Department of Epidemiology. Genetic epidemiology of affective disorders and of Alzheimer's disease.

**Graham A. Colditz, MB, BS** (University of Queensland), MPH, DPH (Harvard University); professor in the Department of Epidemiology. Cancer epidemiology; diet and chronic diseases.

**Chester W. Douglass, DMD** (Temple University), MPH, PhD (University of Michigan); professor in the Department of Epidemiology. Primary affiliation: Harvard School of Dental Medicine. Oral epidemiology and health policy.

**Kathleen M. Egan, MPH** (Boston University), SD (Harvard University); assistant professor in the Department of Epidemiology. Epidemiology of molecular genetics of intraocular tumors; survival determinants in choroidal melanoma; epidemiology of breast and ovarian cancer.

**Edward L. Giovannucci, MD** (University of Pittsburgh), MPH, SD (Harvard University); associate professor in the Departments of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes; methodologies to measure dietary factors in epidemiologic studies.

**Francline Grodstein, SD** (Harvard University); assistant professor in the Department of Epidemiology. Health effects of exogenous hormones; risk factors for Alzheimer's disease.

**Bernard L. Harlow, MPH** (University of Minnesota), PhD (University of Washington); associate professor in the Department of Epidemiology. Survey research methods; risk factors associated with borderline and

malignant ovarian tumors; epidemiologic indicators for adverse obstetrical outcomes.

**Catherine Hayes, DMD** (Tufts University), SM, DMSc (Harvard University); assistant professor in the Department of Epidemiology. Primary affiliation: Harvard School of Dental Medicine. Epidemiology of craniofacial anomalies; outcomes research in the area of periodontal disease.

**Kaumudi J. Joshipura, SM, SD** (Harvard University); assistant professor in the Department of Epidemiology. Primary affiliation: Harvard School of Dental Medicine. Oral epidemiology.

**Andrzej S. Krolewski, MD, PhD** (Warsaw Medical School); associate professor in the Department of Epidemiology. Diabetes mellitus epidemiology.

**I-Min Lee, MB, BS** (National University of Singapore), MPH, SD (Harvard University); assistant professor in the Department of Epidemiology. Epidemiology of cancer; physical activity and fitness and cancer incidence.

**JoAnn E. Manson, MD** (Case Western Reserve University), MPH, DPH (Harvard University); associate professor in the Department of Epidemiology. Chronic disease epidemiology.

**Murray A. Mittleman, MDCM** (McGill University), MPH, DPH (Harvard University); assistant professor in the Department of Epidemiology. Epidemiology of acute risk factors triggering myocardial infarction and stroke; methodological problems in implementing case-crossover studies; psychosocial factors and cardiovascular disease.

**Jane M. Murphy, PhD** (Cornell University); professor in the Department of Epidemiology. Longitudinal studies of psychiatric epidemiology in general populations.

**Johanna M. Seddon, MD** (University of Pittsburgh), SM (Harvard University); associate professor in the Department of Epidemiology. Ophthalmology.

**Daniel E. Singer, MA** (University of Oxford), MD (Harvard University); associate professor in the Department of Epidemiology. Preventive health care.

**Ming T. Tsuang, MD** (National Taiwan University), PhD (University of London); professor in the Department of Epidemiology. Follow-up and family studies of psychiatric disorders with emphasis on schizophrenia and affective disorders.

#### Adjunct Faculty

**Hans-Olov Adami, MD, PhD**; professor of cancer epidemiology, University Hospital, Uppsala, Sweden.

**Richard C. Dicker, MD, SM**; chief medical officer/epidemiology team leader, Division of Health and Standards and Quality, Health Care Financing Administration.

**Anders Ekblom, MB, MD, PhD**; associate professor of surgery, University Hospital, Uppsala, Sweden.

**Albert Hofman, MD, PhD**; professor of epidemiology and chairman, Department of Epidemiology and Biostatistics, Erasmus University Medical School.

**Chung-cheng Hsieh, MPH, SM, SD**; lecturer, Division of Biostatistics and Epidemiology, University of Massachusetts Medical Center.

**Carlo LaVecchia, MD, MSc**; associate professor, Medical Statistics and Biometrics Department, University of Milan.

**K. Malcolm MacLure, SM, SD**; epidemiologist, Ministry of Health, Province of British Columbia, Canada.

**Ralph S. Paffenbarger, Jr., MD, DrPH**; professor of epidemiology emeritus, Stanford University.

**Kenneth J. Rothman, DMD, MPH, DPH**; professor, Departments of Epidemiology and Community Medicine, Boston University.

**Susan L. Santangelo, SD**; assistant professor, Department of Psychiatry, New England Medical Center at Tufts University School of Medicine.

#### Department of Health and Social Behavior

Department chair: **Lisa F. Berkman, MS, PhD** (University of California, Berkeley); Florence Sprague Norman and Laura Smart Norman professor of health and social behavior and of epidemiology. Social epidemiology; epidemiology of aging.

**Dolores Acevedo-Garcia, MPA, PhD** (Princeton University); assistant professor of health and social behavior.

Effects of residential segregation on minority health; health effects of welfare reform and immigration policies on U.S. immigrants and citizens; demographic projections of Latin American immigration to the United States; race/ethnic, gender, and social-class inequalities in health.

**Norman B. Anderson, MA, PhD** (University of North Carolina); professor of health and social behavior. Physiological pathways by which social conditions influence disease in relation to race and ethnicity.

**Elizabeth M. Barbeau, MPH** (Boston University), ScD (University of Massachusetts); assistant professor of health and social behavior. Workplace health and safety policy; work-site cancer prevention; tobacco policy; health inequalities.

**H. William DeJong, MA, PhD** (Stanford University); lecturer on health communication. Use of mass media for health promotion; alcohol and tobacco control policies; drunk-driving prevention; violence prevention; organ donation.

**Karen M. Emmons, MA, PhD** (State University of New York at Stony Brook); associate professor of health and social behavior. Health promotion; smoking and environmental tobacco-smoke health effects; work-site and community-based interventions.

**Steven L. Gortmaker, SM, PhD** (University of Wisconsin); senior lecturer on sociology. Statistical evaluation methods; social class and infant and child health; obesity and television viewing; AIDS; chronic disease.

**S. Jody Heymann, MPP, MD, PhD** (Harvard University); associate professor of health and social behavior; assistant professor of health care policy, Harvard Medical School. Influence of social, labor, and welfare policy on health; health care policy for high-risk children with chronic conditions.

**Ichiro Kawachi, MD, PhD** (University of Otago), DipCommH (College of Community Medicine of New Zealand); associate professor of health and social behavior. Social inequalities in health, especially related to income distribution; stress and cardiovascular disease; quality of life and healthy aging; tobacco control.

**Bruce P. Kennedy, MEd** (Antioch University), EdD (Harvard University); assistant professor of health and social behavior. Social determinants of health inequalities; interactions between social determinants of child and adolescent health and developmental vulnerabilities.

**Nancy Krieger, MS** (University of Washington), PhD (University of California, Berkeley); associate professor of health and social behavior. Social inequalities in health, especially regarding race/ethnicity, social class, and gender; cancer, especially breast cancer; cardiovascular disease, especially hypertension; epidemiologic theory and history.

**Laura D. Kubzansky, MSc** (London School of Economics and Political Science), PhD (University of Michigan), MPH (Harvard University); assistant professor of health and social behavior. Psychosocial determinants of health; social inequality and health; emotion and performance.

**Rima E. Rudd, MSPH** (University of Massachusetts), ScD (Johns Hopkins University); lecturer on health education. Public health and adult education pedagogy; normative change and change strategies, including small-group communications, community organizing, social marketing, and health and literacy.

**Glorian Sorensen, MPH, PhD** (University of Minnesota); professor of health and social behavior. Cancer prevention in the workplace; intervention research in community and occupational settings.

**Henry Wechsler, AM, PhD** (Harvard University); lecturer on social psychology. Alcohol and drug use and related high-risk behaviors among youth; epidemiologic, preventive, and public policy approaches to substance abuse prevention.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.*

**Lawren H. Daltroy, MPH** (University of Michigan), DrPH (Johns Hopkins University); associate professor in the Department of Health and Social Behavior. Application of social psychology and decision-making theory to patient education in chronic disease; functional status measurement in arthritis.

**Thomas S. Inui, MD, ScM** (Johns Hopkins University); professor in the Department of Health and Social Behavior. Primary care effectiveness; health-related behavior; clinical prevention.

**Sue Ellen Levkoff, MSW** (New York University), SM, SD (Harvard University); associate professor in the Department of Health and Social Behavior. Influence of culture on the experience of and response to dementia symptoms; prevention of excess disability in cognitively impaired aged; delirium in the hospitalized elderly.

#### Adjunct Faculty

**Anne M. Stoddard, SM, SD**; associate professor of public health, University of Massachusetts.

### Department of Health Policy and Management

**Department chair: Arnold M. Epstein, AM** (Harvard University), MD (Duke University); John H. Foster professor of health policy and management. Access and quality of care, especially in disadvantaged populations.

**Robert J. Blendon, MBA** (University of Chicago), MPH, ScD (Johns Hopkins University); professor of health policy and management. Politics of health care; access to health care; approaches to health care reform; influence of public opinion in shaping health policy.

**Karen Donelan, MEd, SD** (Harvard University); assistant professor of health policy and management. Survey research methods; comparative international health system analysis; access to health services and insurance; electronic sources of consumer information.

**Harvey V. Fineberg, MD, MPP, PhD** (Harvard University); professor of health policy and management and provost of Harvard University. Technology assessment; cost-effectiveness and decision analysis; AIDS policy, prevention, and education; vaccine evaluation and policy; health care reform.

**Susanne J. Goldie, MD** (Albany Medical College), MPH (Harvard University); assistant professor of health decision science. Development of disease-specific transition models; quality-of-life assessment for individuals and populations;

cost-effectiveness analysis of preventive medical interventions; programming methods in clinical decision modeling.

**John D. Graham, AM** (Duke University), PhD (Carnegie-Mellon University); professor of policy and decision sciences and director of the Harvard Center for Risk Analysis. Environmental protection; prevention of intentional and accidental injury.

**George M. Gray, MS, PhD** (University of Rochester); lecturer on risk analysis. Risk characterization to inform policy decisions; risk assessment and right-to-know; analysis of food safety; interpretation of rodent cancer bioassays for human health risk assessment.

**James K. Hammitt, SM, MPP, PhD** (Harvard University); associate professor of economics and decision sciences. Mathematical modeling and analysis of economic behavior and decision making under uncertainty, with applications to evaluation, regulation, and management of health and environmental quality.

**David Hemenway, AM** (University of Michigan), PhD (Harvard University); professor of health policy and director of the Harvard Injury Control Research Center. Intentional and unintentional injury; health care economics.

**William C. Hsiao, MPA, PhD** (Harvard University); K. T. Li professor of economics; member of the faculty, Harvard Business School. Health care systems; control of health care costs; universal insurance coverage.

**Nancy M. Kane, MBA, DBA** (Harvard University); lecturer on management. Financial health and competitive strategies of health care organizations; provider behavior under third-party payment systems.

**Jack Kasten, MPH** (University of Michigan), JD (Boston College); lecturer on health services. Managed care; service utilization; manpower issues; hospital organization and management.

**Karen M. Kuntz, SM, SD** (Harvard University); assistant professor of health decision science. Cost-effectiveness analysis of cancer-screening strategies and development of disease-specific multi-attribute utility scales.

**Leonard J. Marcus, MSW** (University of Wisconsin), PhD (Brandeis University); lecturer on public health practice. Negotiation, conflict resolution, and use of mediation in health care settings; effects of conflict on health care decision making and outcomes.

**Jack Needleman, MA** (Syracuse University), PhD (Harvard University); assistant professor of economics and health policy. Health economics and health policy; econometrics; research design and evaluation; applied policy analysis; management of the policy process; hospital finance.

**Peter J. Neumann, MA** (University of Pennsylvania), SD (Harvard University); assistant professor of policy and decision sciences. Cost-effectiveness analysis in health and medicine, pharmacoconomics, medical technology assessment, and federal and state health policy on pharmaceuticals and medical technology.

**Joseph P. Newhouse, PhD** (Harvard University); **John D. MacArthur** professor of health policy and management in the Faculties of Medicine, Government, Public Health, and Arts and Sciences; director of the Harvard University Division of Health Policy Research and Education; and chair of the Committee on Higher Degrees in Health Policy. Financing and organization of medical care; medical malpractice; manpower policy; outcome research.

**R. Heather Palmer, MB, BCh** (University of Cambridge), SM (Harvard University); professor of health policy and management and director of the Center for Quality of Care Research and Education. Quality of health care; incorporation of evaluation measures into health care reform plans.

**Deborah B. Prothrow-Stith, MD** (Harvard University); professor of public health practice and associate dean for faculty development. Community-based violence prevention; violence prevention protocols for primary care settings.

**Marc J. Roberts, PhD** (Harvard University); professor of political economy. Health policy; environmental policy; ethical aspects of allocating scarce public health resources.

**Meredith Rosenthal, PhD** (Harvard University); assistant professor of health economics and policy. Empirical studies of the impact of financial incentives and organization on

physician behavior; econometric models of health care provider behavior; application of methodological innovations for the estimation of causal effects in nonexperimental research.

**Katherine Swartz, MS, PhD** (University of Wisconsin); associate professor of health policy and management. Analysis of populations without health insurance; development of policies to finance universal health insurance; structures of financial incentives for physicians. (On leave 9/1/00-6/30/01)

**Kimberly M. Thompson, MS** (Massachusetts Institute of Technology), SD (Harvard University); assistant professor of risk analysis and decision science. Analysis of the risks, costs, and benefits of using airbags as life-saving devices; applications of value of information (VOI) techniques to environmental health decisions; regulatory developments in the dry cleaning and pulp and paper industries.

**Milton C. Weinstein, AM, MPP, PhD** (Harvard University); **Henry J. Kaiser** professor of health policy and management (Health Policy and Management and Biostatistics); professor of medicine, Harvard Medical School. Cost-effectiveness of health practices and technologies.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.*

**David W. Bates, MD** (Johns Hopkins University), SM (Harvard University); associate professor in the Department of Health Policy and Management. Clinical decision making and physician behavior; quality of care and cost-effectiveness; outcome assessment.

**Donald M. Berwick, MPP, MD**; associate professor in the Department of Health Policy and Management. Health care quality assessment, management, and improvement; technology assessment and cost-effectiveness analysis; decision analysis and clinical epidemiology; preventive medicine and clinical preventive practice.

**Troyen A. Brennan, MA** (University of Oxford), JD, MPH, MD (Yale University); professor in the Department of Health Policy and Management. Medical ethics; personal injury and environmental litigation; medical malpractice and health policy reform.

**David J. Cohen, MD, SM** (Harvard University); assistant professor in the Department of Health Policy and Management. Application of health outcomes research and cost-effectiveness analysis to interventional cardiology.

**G. Scott Gazelle, MD** (Case Western Reserve University), MPH, PhD (Harvard University); associate professor in the Department of Health Policy and Management. Technology assessment; health services research.

**Robert A. Greenes, MD, PhD** (Harvard University); professor in the Department of Health Policy and Management. Medical informatics; design and development of a modular approach to knowledge management; facilitating integration of the work of multiple contributors.

**Richard C. Hermann, MD** (University of Michigan), SM (Harvard University); assistant professor in the Department of Health Policy and Management. Variation and appropriateness of mental health practices; quality assessment and improvement of mental health care.

**Thomas H. Lee, Jr., MD** (Cornell University), SM (Harvard University); associate professor in the Department of Health Policy and Management. Prognostic stratification in and cost-effectiveness analysis of cardiovascular disease management.

**Matthew H. Liang, MD, MPH** (Harvard University); professor in the Department of Health Policy and Management. Epidemiology of rheumatic disease and disability; clinimetrics; health services research; technology assessment.

**Tracy A. Lieu, MD** (University of California, San Francisco), MPH (University of California, Berkeley); associate professor in the Department of Health Policy and Management. Children's primary care delivery and outcomes; cost-effectiveness analysis.

**Richard F. Mollica, MD** (University of New Mexico), MAR (Yale University); associate professor in the Department of Health Policy and Management. Survey instruments for traumatized populations; cross-cultural psychiatry and psychiatric epidemiology; international health policy.

**Jane C. Weeks, MD, SM** (Harvard University); associate professor in the Department of Health Policy and Management. Outcomes of cancer treatment; effectiveness of

resource utilization in medical oncology; medical decision making in oncology.

#### Adjunct Faculty

**Donald S. Bialek, MD, SM, MPH**; private consultant in medical informatics.

**Angela Browne, PhD**; senior justice fellow, Soros Institute of Peace.

**David E. Burmaster, MPP, PhD**; consultant, Alecon, Cambridge, MA.

**S. Philip Caper, MS, MD**; chairman, chief executive officer, and president, Codman Research Group, Inc.

**Gail Charnley, PhD**; scientist, Energy Resources Company, Cambridge, MA.

**Karl P. Claxton, MSc, DPhil**; lecturer on health economics, University of York.

**Mark G. Field, AM, PhD**; professor of sociology emeritus, Boston University.

**Kenneth A. Freedberg, MD, SM**; associate professor of biostatistics and epidemiology, Boston University School of Public Health.

**Pamela S. Green, JD**; private consultant on health law and policy.

**Sheldon Greenfield, MD**; professor of medicine, Tufts University.

**Amy A. Harbaugh, MBA**; director of lending, Community Health Center Capital Fund.

**Maria G. M. Hunink, MD, PhD**; professor in clinical epidemiology, Erasmus University Medical School.

**Andrew L. Hyams, JD, MPH**; senior policy associate, Urban Health Institute, Boston Department of Health and Hospitals.

**Sherrie H. Kaplan, MPH, MSPH, MS, PhD**; adjunct associate professor of medicine, Tufts University School of Medicine.

**Christian M. Koeck, MD, MPH, SM, SD**; executive vice president, Vienna City Hospital Association, and chair, Department of Organizational Development.

**Zita Lazzarini, MPH, JD**; private consultant.

**Lucian L. Leape, MD**; adjunct professor of health policy in the Faculty of Public Health.

**Beng Liljas**, PhD; director, Health Economics and Outcomes Management, Medical and Scientific Affairs, Astra Pharmaceuticals and AstraZeneca.

**Eugene Litvak**, MS, PhD; adjunct lecturer.

**George D. Lundberg II**, MD, MS, ScD; editor, Medscape.

**John E. McDonough**, MPH, PhD; senior associate, Institute for Health Policy, Brandeis University.

**Daniel D. Moriarty**, MBA; vice president, Information Systems Group, John Snow, Inc.

**George B. Moseley III**, MBA, JD; instructor, University Seminar Center.

**Benjamin W. Moulton**, MPH, JD; executive director, American Society of Law, Medicine and Ethics.

**Jeremy J. Nobel**, MD, MPH, SM; medical director, GTE Laboratories.

**John A. Norris**, JD, MBA; president and chief executive officer, John A. Norris Esquire, PC.

**James L. J. Nuzzo**; managing partner, Colchester Group.

**Joseph S. Pliskin**, SM, PhD; Sidney Liswood professor of health care management, Ben-Gurion University.

**Dorothy E. Puhy**, MBA; chief financial officer and assistant treasurer, Dana-Farber Cancer Institute.

**Howard Rivenson**, MBA; chief financial officer, East Boston Neighborhood Health Center.

**Richard B. Siegrist, Jr.**, MS, MBA; vice president and chief financial officer, Transition Systems, Inc.

**Nancy C. Turnbull**, MBA; private consultant.

**Glenn K. Wasek**, SM; vice president and director, Marketing Group, John Snow, Inc.

## Department of Immunology and Infectious Diseases

**Department chair:** **Myron E. (Max) Essex**, DVM, PhD (University of California, Davis); John LaPorte Given professor of immunology and infectious disease and chair of the Harvard AIDS Institute. Role of retroviruses as infectious agents in human leukemias and AIDS; mechanisms of immunosuppression by retroviruses; identification and characterization of retroviral proteins

for seroepidemiological and diagnostic value and for vaccine development; hepatitis B virus and human liver cancer.

**Barry R. Bloom**, PhD (Rockefeller University); professor of immunology and infectious diseases (Immunology and Infectious Diseases and Population and International Health) and dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

**Barbara Burleigh**, PhD (University of Western Ontario); assistant professor of immunology and infectious diseases. Molecular and cellular basis of *Trypanosoma cruzi*-host cell interactions; host cell invasion; signal transduction; *Trypanosoma cruzi* differentiation.

**John R. David**, MD (University of Chicago); Richard Pearson Strong professor of tropical public health. Immunology of migration inhibitory factor (MIF); the biologic role using MIF-deficient mice; the biology of parasitism, focusing on leishmania; transfer of technology from the bench to field sites (Brazil) on problems of host resistance, risk factors, therapies, and control strategies. (On leave 7/1/00-6/30/01)

**Laurie H. Glimcher**, MD (Harvard University); Irene Heinz Given professor of immunology; professor of medicine, Harvard Medical School. Genetic regulation of the immune response; the role of 1a (class II) major histocompatibility complex molecules and T-cell receptor proteins in T-lymphocyte activation; molecular mechanisms of regulation of the class II genes; function and regulation of the T-cell-derived cytokine interleukin-4.

**Michael J. Grusby**, PhD (Northwestern University); associate professor of molecular immunology. Molecular and genetic analysis of cytotoxic T-lymphocyte-mediated lysis; generation of in vivo models of immune deficiency by homologous recombination in embryonic stem cells.

**Donald A. Harn, Jr.**, AM (University of Northern Colorado), PhD (University of California, Los Angeles); professor of tropical public health. Regulation or direction of immune

responses due to the molecular composition of particular antigens; development of synthetic peptide and DNA vaccines for parasitic diseases.

**I-Cheng Ho**, MD (Taipei Medical College), PhD (University of Michigan); assistant professor of molecular immunology. Molecular regulation and differentiation of GATA-3; expression of sPLA2 in the differentiation of T-cells.

**Phyllis J. Kanki**, DVM (University of Minnesota), SD (Harvard University); professor of pathobiology. Pathobiology of human and simian retroviruses, including HTLV-1, STLV-1, SIV, HIV-1, and HIV-2; characterization of the immune response to various viral antigens and their correlation to stage of infection or disease.

**Igor Kramnik**, MD (Samara Medical Institute), PhD (Gabrichevsky Institute of Epidemiology, Immunology, and Microbiology); assistant professor of immunology. Immunology and immunogenetics of infectious diseases; development and testing of diagnostic tools for predicting the susceptibility to tuberculosis in experimental models and human populations; vaccine development and testing.

**Tun-Hou Lee**, SM, SD (Harvard University); professor of virology. Humoral response to retroviral infections in humans; identification of coding sequences of human retroviruses and their gene products; evaluation of the relative immunogenicity of retroviral peptides for serodiagnosis and vaccine development.

**Eric J. Rubin**, MD, PhD (Tufts University); assistant professor of immunology and infectious diseases. Virulence factors of mycobacteria; acquisition of virulence determinants by *Vibrio cholerae*; generalized transposon mutagenesis systems for bacteria.

**John C. Samuelson**, MD, PhD (Harvard University); associate professor of tropical public health. Use of molecular biological and biochemical techniques to study *Entamoeba histolytica*, the protozoan parasite that causes amebic dysentery.

**Andrew Spielman**, ScD (Johns Hopkins University); professor of tropical public health. Epidemiology of vector-borne disease; physiology and ecology of mosquitoes and ticks; development of infectivity of pathogens in mosquitoes and ticks.

**Ali A. Sultan**, MB, BS (University of Khartoum), PhD (University of Edinburgh); assistant professor of immunology and infectious diseases. Biochemistry and molecular pathogenesis of parasites.

**Dyann F. Wirth**, PhD (Massachusetts Institute of Technology); professor of tropical public health. Mechanisms of drug resistance in malaria, including molecular genetic analysis and field-based studies; genetic analysis of malaria transmission; analysis of gene expression; trans-splicing and homologous recombination in *Leishmania enriettii* using molecular genetic techniques.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.*

**Donald A. Goldmann**, MD (Harvard University); professor in the Department of Immunology and Infectious Diseases. Epidemiology of nosocomial infections; epidemiologic approaches to medical outcomes assessment and hospital quality improvement.

**Martin S. Hirsch**, MD (Johns Hopkins University); professor in the Department of Immunology and Infectious Diseases. Pathogenesis and therapy of human retrovirus and herpes virus infections.

**James H. Maguire**, MD, MPH (Harvard University); associate professor in the Department of Immunology and Infectious Diseases. Clinical features and epidemiology of parasitic diseases.

**Kenneth McIntosh**, MD (Harvard University); professor in the Department of Immunology and Infectious Diseases. Pathogenesis, prevention, and treatment of pediatric respiratory viral diseases; coronaviruses; new methods in viral diagnosis.

## Adjunct Faculty

**Kenneth H. Mayer**, MD; professor of medicine and community health, Brown University School of Medicine.

**Mary E. Russell**, MD; medical director, Parexel International, Inc.

## Department of Maternal and Child Health

**Department chair:** Marie C.

**McCormick,** MD, ScD (Johns Hopkins University); Sumner and Esther Feldberg professor of maternal and child health and director of the Harvard Center for Children's Health; professor of pediatrics, Harvard Medical School. Infant mortality; outcomes of high-risk neonates and interventions to ameliorate adverse outcomes.

**Iain W. Aitken,** MB, BChir (University of Cambridge), DCMT (University of London), MPH (Harvard University); lecturer on maternal and child health (Maternal and Child Health and Population and International Health). Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

**Stephen L. Buka,** SM, SM, SD (Harvard University); associate professor of maternal and child health and epidemiology. Causes and prevention of behavioral and developmental disorders of children.

**Felton J. Earls,** MD (Howard University); professor of human behavior and development; professor of child psychiatry, Harvard Medical School. Longitudinal research to understand how community, family, and individual factors influence delinquent and criminal behavior.

**Michael L. Ganz,** MS, MPhil, PhD (Columbia University); assistant professor of maternal and child health. The relationship between socioeconomic factors, behaviors, ecologic factors, and maternal and child health measures; applicability of health economics models and econometric methods to analysis of maternal and child health data.

**Laura A. McCloskey,** PhD (University of Michigan); associate professor of maternal and child health. Origins and sequelae of wife and child abuse; family origins of child psychopathology; women's mental health; victimization; posttraumatic stress.

**Karen E. Peterson,** RD (Peter B. Brigham Hospital), SD (Harvard University); associate professor of nutrition (Maternal and Child Health and Nutrition). Epidemiology of malnutrition in industrialized and developing countries.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.*

**Allen C. Crocker,** MD (Harvard University); associate professor in the Department of Maternal and Child Health. Chronic illness and developmental disabilities in children; mechanisms of disability.

**Barbara Gottlieb,** MD (Tufts University), MPH (Boston University); assistant professor in the Department of Maternal and Child Health. Unintended pregnancy; cervical cancer; minority and community health; HIV risk and prevention; adolescent and school health; application of research methods in a community setting; methods of program evaluation.

**Charles J. Homer,** MD (University of Pennsylvania), MPH (University of North Carolina); assistant professor in the Department of Maternal and Child Health. Application of epidemiologic methods to the assessment of the effectiveness of health care services.

**Daniel J. Kindlon,** MS, PhD (Cornell University); assistant professor in the Department of Maternal and Child Health. Causes of behavior disorders and learning disabilities.

**Ellice S. Lieberman,** MD (University of Florida), MPH, DPH (Harvard University); associate professor in the Department of Maternal and Child Health. Perinatal epidemiology; risk factors for adverse pregnancy outcomes; assessment of new technologies and care practices in obstetrics.

**Eli H. Newberger,** MD (Yale University), SM (Harvard University); lecturer in the Department of Maternal and Child Health. Child abuse and family violence.

**Judith S. Palfrey,** MD (Columbia University); professor in the Department of Maternal and Child Health. Development of preschool children; interface of health and educational services for children.

**Joan Y. Reede,** MD (Mount Sinai School of Medicine), MPH, SM (Harvard University); assistant professor in the Department of Maternal and Child Health. Biomedical manpower and academic/research career development; provision of health services to and impact of health policy on disadvantaged, minority, and special populations.

**Douglas K. Richardson,** MD (Johns Hopkins University), MBA (University of Pennsylvania); associate professor in the Department of Maternal and Child Health. Impact of variations in practice styles on outcomes, resource use, and costs of neonatal intensive care.

**Benjamin P. Sachs,** MD, BS, MRCS, LRCP (University of London), DPH (University of Toronto); professor in the Department of Maternal and Child Health. Epidemiology and health policy issues relating to women and children in technological evaluation, infant mortality, and medical services.

**Edward C. Tronick,** MS (Cornell University), PhD (University of Wisconsin); associate professor in the Department of Maternal and Child Health. Neurodevelopment of infants and children exposed to drugs in utero; depressive symptoms and mother-infant interaction.

### Adjunct Faculty

**Robin J. R. Blatt,** Dip. Nursing, MPH; genetics coordinator/public health nursing adviser, Massachusetts Department of Public Health.

**Johanna T. Dwyer,** SM, SM, SD; professor of medicine and community health and director, Stern Nutrition Center, Tufts Medical Center.

**Marie P. Farrell,** MS, MSN, EdD, MPH; Professor Walter Schroeder endowed chair in nursing research, University of Wisconsin.

**William T. Garrison,** MA, PhD; professor of pediatrics and psychiatry, University of Massachusetts Medical School.

**David T. Helm,** MA, PhD; adjunct associate professor, Sociology Department, Boston University; research associate, Children's Hospital.

**William E. Kiernan,** MEd, MBA, PhD; research associate, Children's Hospital.

**Lawrence C. Kleinman,** MD, MPH; associate professor, Pennsylvania State University College of Medicine.

**John W. Kulig,** MD, MPH; associate professor, Tufts University School of Medicine.

**Beat Mohler,** MD, DrMed; assistant professor, child psychiatry, public health, University of Basel, Switzerland.

**Norma M. Swenson,** MPH; writer and consultant.

**Deborah K. Walker,** EdM, EdD; associate commissioner for programs and prevention, Massachusetts Department of Public Health.

## Department of Nutrition

**Department chair:** Walter C. Willett, MD (University of Michigan), MPH, DPH (Harvard University); Fredrick John Stare professor of epidemiology and nutrition; professor of medicine, Harvard Medical School. Relation of dietary factors to the occurrence of human disease, in particular heart disease and cancer. (On leave 9/1/00-12/31/00)

**Alberto Ascherio,** MD (University of Milan), diploma (London School of Hygiene and Tropical Medicine), MPH, DPH (Harvard University); associate professor of nutrition and epidemiology. Relation of dietary factors to the occurrence of human disease.

**Hannia Campos,** MS, PhD (Tufts University); assistant professor of nutrition. Human lipoprotein metabolism; cross-cultural studies of diet and cardiovascular risk factors with emphasis on Hispanic populations; gene-environment interactions; biochemical markers of dietary intake.

**Wafaie W. Fawzi,** MB, BS (University of Khartoum), MPH, SM, DPH (Harvard University); assistant professor of international nutrition and epidemiology. Etiologies of infectious diseases with emphasis on dietary and nutritional causes; relationships of dietary factors to disease in pregnancy and childhood.

**Gökan S. Hotamisligil,** MD (Ankara University), PhD (Harvard University); associate professor of nutrition. Studies on the regulatory pathways that control energy metabolism; signal transduction in mammalian cells; biology of fatty-acid binding proteins; genetic manipulation of mice.

**Frank B. Hu,** MD (Tongji Medical University), MPH, PhD (University of Illinois at Chicago); assistant professor of nutrition. Nutritional epidemiology methodology; epidemiology of cardiovascular disease, particularly dietary factors.

**David J. Hunter, MB, BS** (University of Sydney), MPH, SD (Harvard University); professor of epidemiology and director of the Harvard Center for Cancer Prevention. Cancer epidemiology; molecular epidemiology.

**Jeffrey M. Leiden, PhD, MD** (University of Chicago); Elkan R. Blout professor of biological sciences. Transcriptional regulation of T-cell development and function; transcriptional regulation of cardiovascular development; somatic gene therapy for cardiovascular diseases.

**Karen E. Peterson, RD** (Peter B. Brigham Hospital), SD (Harvard University); associate professor of nutrition (Maternal and Child Health and Nutrition). Epidemiology of malnutrition in industrialized and developing countries.

**Guy L. Reed III, MS, MD** (Stanford University); associate professor of immunology. Analysis of platelet activation and cellular interactions by molecular cloning, biochemical, and histological techniques.

**Eric B. Rimm, SD** (Harvard University); associate professor of epidemiology and nutrition. Relation of dietary factors to the occurrence of human diseases, in particular cardiovascular disease.

**Meir J. Stampfer, MD** (New York University), MPH, DPH (Harvard University); professor of epidemiology and nutrition. Influence of diet and exogenous hormones on health, particularly heart disease and cancer.

**Marianne Wessling-Resnick, MS** (University of Chicago), PhD (University of Massachusetts); professor of nutritional biochemistry. Regulation of the cellular uptake of macromolecular nutrients; molecular basis of iron transport.

The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School.

**Marla J. Berry, PhD** (University of California, Santa Barbara); assistant professor in the Department of Nutrition. Selenoprotein synthesis and translational control of gene expression.

**Christopher P. Duggan, MD** (Johns Hopkins University), MPH (Harvard University); assistant professor in the Department of Nutrition. Nutritional management of acute and

persistent diarrhea; aspects of protein and amino acid metabolism in malnutrition.

**Edward L. Giovannucci, MD** (University of Pittsburgh), MPH, SD (Harvard University); associate professor in the Departments of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes; methodologies to measure dietary factors in epidemiologic studies.

**Clifford W. Lo, MD** (University of Hawaii), MPH (University of California, Los Angeles), ScD (Massachusetts Institute of Technology); assistant professor in the Department of Nutrition. Calcium, vitamin D, and parathyroid metabolism; total parenteral nutrition.

**Mark Perrella, MD** (University of Nebraska); assistant professor in the Department of Nutrition. Identification of factors important in regulating vascular tone during septic shock and the molecular mechanisms that regulate these factors.

**Frank M. Sacks, MD** (Columbia University); associate professor in the Department of Nutrition. Human lipoprotein metabolism; effects of diet and hormones; dietary fatty acids, cardiovascular disease, and cancer.

**Wiley W. Souba, MD** (University of Texas at Houston), SD (Harvard University); professor in the Department of Nutrition. Nutrition, metabolism, and cancer; impact of glutamine nutrition on cellular function, metabolism, and structure.

**W. Allan Walker, MD** (Washington University); professor in the Department of Nutrition. Gastrointestinal immunology; developmental gastroenterology; protective functions of breast milk; macromolecular transport; intestinal gene expression.

### Department of Population and International Health

Department chair: **Michael R. Reich, AM, PhD** (Yale University); Taro Takemi professor of international health policy. Political economy of health and development; health consequences of development policy; health policy in Japan.

**Iain W. Aitken, MB, BChir** (University of Cambridge), DCMT (University of London), MPH (Harvard University); lecturer on maternal and child health (Maternal and Child Health

and Population and International Health). Maternal health care; management of primary health care workers; design and financing of urban health care systems in developing countries.

**Peter A. Berman, MSc, PhD** (Cornell University); professor of international health economics. Health care financing in developing countries; economic assessment of health policies and programs.

**Barry R. Bloom, PhD** (Rockefeller University); professor of immunology and infectious diseases (Immunology and Infectious Diseases and Population and International Health) and dean of the Faculty of Public Health. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

**David E. Bloom, MA, PhD** (Princeton University); professor of economics and demography. Applied microeconomics: labor, population, health, development, and environment; demography.

**Thomas J. Bossert, MA, PhD** (University of Wisconsin, Madison); lecturer on international health policy. Health policy in developing countries, especially in Latin America, Africa, and Indonesia.

**Paul H. Campbell, MPA** (Portland State University), SD (Harvard University); lecturer on management. Financial management, strategic planning, and reimbursement systems; health services in developing countries.

**Richard A. Cash, MD** (New York University), MPH (Johns Hopkins University); lecturer on international health. Development of health systems for rural and urban populations in developing countries.

**Arthur J. Dyck, AM** (University of Kansas), PhD (Harvard University); Mary B. Saltonstall professor of population ethics; member of the faculty, Harvard Divinity School. Concepts of human rights, including ethical issues.

**Sophia M. Gruskin, JD** (Benjamin N. Cardozo School of Law), SD (Harvard University); lecturer on health and human rights. Health and human rights; gender, reproductive, and sexual health; global implica-

tions for the rights of the child to health; links between HIV/AIDS, health, and human rights.

**Joseph J. Harrington, AM, PhD** (Harvard University); professor of environmental health engineering (Environmental Health and Population and International Health); Gordon McKay professor of environmental engineering, Faculty of Arts and Sciences. Water resources planning and quality management; environmental monitoring and control systems; applied statistics for model systems; management for tropical disease control.

**Allan G. Hill, PhD** (University College, Durham), diploma in demography (Princeton University); Andelot professor of demography. Demography of the Middle East and West Africa; impact on mortality of child survival programs; modern contraception and reproductive health.

**Saidi H. Kapiga, MD** (University of Dar es Salaam), MPH, SD (Harvard University); assistant professor of reproductive health. Development and assessment of community-based HIV/STD control programs; development and testing of interventions to reduce perinatal transmission of HIV; determinants of fertility, provision of family-planning services, and cervical cancer.

**Ulla M. Larsen, MA** (Odense University), PhD (Princeton University); associate professor of demography. Interface of demography and health; sterility and reproductive health; focus on Africa.

**Jennifer Leaning, SM** (Harvard University), MD (University of Chicago); professor of health and human rights. Medical human rights and international law; complex humanitarian emergencies; medical triage in war and disasters; environmental effects of war.

**Richard Levins, PhD** (Columbia University); John Rock professor of population sciences. Human ecology; viability of populations and environments; special interest in Caribbean region.

**Yuanli Liu, MD** (Wuhan Medical School), MPH (Tongji Medical University), SM (Harvard University), PhD (University of Minnesota); assistant professor of international health. Equity in health care; health care financing in developing coun-

tries; Chinese health care system; interaction of health and social security systems.

**Stephen P. Marks**, Doctorat d'état (University of Nice), Dipl. (University of Law, Economics, and Social Studies of Paris); François-Xavier Bagnoud professor of health and human rights and director of the François-Xavier Bagnoud Center for Health and Human Rights. Human rights and international affairs.

**Christopher J. L. Murray**, MD (Harvard University), DPhil (University of Oxford); professor of international health economics. Tuberculosis-control strategies with an emphasis on cost-effectiveness; health transition studies. (On leave 7/1/00–6/30/01)

**Carla M. Obermeyer**, MA, MSc (American University of Beirut), SD (Harvard University); associate professor of population and anthropology. Cultural context of health and reproduction; reproductive health care in North Africa; demography of Arab countries; population policies in the Middle East; cultural construction and management of menopause in Morocco and Lebanon. (On leave 7/1/00–6/30/01)

**M. Omar Rahman**, MD (Northwestern University), MPH, SD (Harvard University); associate professor of demography and epidemiology. Healthy aging in rural societies; determinants of pregnancy outcomes in developing countries; assessment of adult health status and international comparisons of gender differences; assessment of quality of health care services; socioeconomic determinants of adult health. (On leave 7/1/00–6/30/01)

**Grace Wyshak**, SM (Harvard University), PhD (Yale University); associate professor in the Departments of Biostatistics and Population and International Health. Biostatistical and demographic methods; women's reproductive health.

**Chi-Man (Winnie) Yip**, PhD (Massachusetts Institute of Technology); assistant professor of international health policy and economics. Application of economic models and econometric techniques to study of health care policies.

*The following faculty members have secondary appointments at HSPH. Their primary affiliation is with Harvard Medical School unless otherwise indicated..*

**Mary Carlson**, MA (University of Wisconsin), PhD (Northwestern University), MPA (Harvard University); associate professor in the Department of Population and International Health. Recovery of behavioral function after brain damage or sensory deprivation; consequences of social deprivation in institutionalized infants; street children and child-rights legislation in Brazil.

**Sheila Sen Jasanooff**, MA (University of Bonn); PhD, JD (Harvard University); professor in the Department of Population and International Health. Primary affiliation: John F. Kennedy School of Government. Comparative study of biotechnology in Britain, Germany, and the United States.

**Mary E. Wilson**, MD (University of Wisconsin); associate professor in the Department of Population and International Health. Infections acquired during travel and residence in tropical and developing countries.

#### Adjunct Faculty

**John C. Caldwell**, PhD; professor and chairman, Department of Demography, Australian National University.

**Adetokunbo O. Lucas**, MD, SM; consultant.

**Amartya K. Sen**, MA, PhD; master of Trinity College, University of Cambridge.

**Gita Sen**, MA, PhD; professor, Indian Institute of Management.

#### Division of Biological Sciences Core Mentoring Faculty

Robert B. Barnett	Associated Faculty
Barry R. Bloom	Alberto B. Ascherio
Joseph D. Brain	Marla J. Berry
Harriet A. Burge	James P. Butler
Barbara Burleigh	Jack T. Dennerlein
Hannia N. Campos	Douglas W. Dockery
David C. Christiani	Jeffrey M. Drazen
John R. David	Ellen A. Eisen
Bruce F. Demple	Alan Eschenroeder
Myron E. (Max) Essex	John S. Evans
Timothy E. Ford	Wafaie W. Fawzi
Jeffrey J. Fredberg	Edward L. Giovannucci
Laurie H. Glimcher	John J. Godleski
Beatriz S. González-Flecha	Diane R. Gold
Michael J. Grusby	Rose H. Goldman
Donald A. Harn, Jr.	Donald A. Goldmann
I-Cheng Ho	Joseph J. Harrington
Gökhan S. Hotamisligil	Russ B. Hauser
Phyllis J. Kanki	Robert F. Herrick
Karl T. Kelsey	Martin S. Hirsch
Lester Kobzik	Howard Hu
Igor Kramnik	Stephen N. Kales
Tun-Hou Lee	Rokho Kim
Jeffrey M. Leiden	Petros Koutrakis
John B. Little	Howard L. Liber
Carl G. Maki	Clifford W. Lo
Joseph P. Mizgerd	Nancy Long-Sieber
Joseph D. Paulauskis	Stephen H. Loring
Mark A. Perrella	James H. Maguire
Karen E. Peterson	Kenneth H. Mayer
Guy L. Reed	Kenneth McIntosh
Frank M. Sacks	Donald K. Milton
Leona D. Samson	Thomas P. Monath
John C. Samuelson	Richard R. Monson
Robert H. Schiestl	Lucas M. Neas
Stephanie A. Shore	Peter Ofner
Joseph G. Sodroski	Robert B. Pojasek
Ali Sultan	Eric B. Rimm
Armen H. Tashjian, Jr.	Stephen N. Rudnick
Ning Wang	Mary E. Russell
Marianne Wessling-Resnick	Robert Schlegel
Walter C. Willett	Joel D. Schwartz
Dyann F. Wirth	Jacob Shapiro
Dieter A. Wolf	James P. Shine
Xiping Xu	Charles B. Shoemaker
Zhi-Min Yuan	Thomas J. Smith

#### Associated Faculty

Angeline E. Warner	W. Allan Walker
David H. Wegman	Meir J. Stampfer
Scott Weiss	Helen H. Suh
Grace Wyshak	George P. Topulos
Yukio Yanagisawa	Richard L. Verrier
	W. Allan Walker
	Angeline E. Warner
	David H. Wegman
	Scott Weiss
	Grace Wyshak
	Yukio Yanagisawa



## Course Offerings, 2000-01

Please note that the following list of courses may be incomplete and is subject to change. Detailed course listings, including information about prerequisites, course activities, and scheduling, are distributed to students with registration information. The Registrar's Office also maintains a listing of courses sponsored by HSPH faculty members but taught primarily by others. Also note that the list below is for academic year 2000-01 only. Courses for academic year 2001-02 will vary substantially from those described here; a course listing for 2001-02 will not be available until summer/fall 2001.

Departmental courses appear first; courses for the master of public health program, those for the Division of Biological Sciences, and other interdisciplinary offerings appear at the end of this section. Letters following course numbers indicate the period(s) in which a course is given: *a* and *b* (fall quarters); *c* and *d* (spring quarters); *e* and *f* (one-week sessions in January and March); *s* and *t* (2000) summer session.

### Department of Biostatistics

**BIO 112a. Computing Principles and Methods (M. Pagano, E. Allred)**  
Provides basic computer literacy to students from all disciplines. Topics include computer architecture and terminology; E-mail and the World Wide Web; and a variety of Windows-environment packages, including word processing, graphics, statistical analysis, spreadsheets, and data management programs. (2.5 credits)

**BIO 113. Introduction to SAS**  
**BIO 113b. (M. Pagano, E. Allred)**  
(2.5 credits)

**BIO 113e. (M. Pagano, T. Fenton)**  
(1.25 credits)

**BIO 113s. (M. Pagano, E. Allred)**  
(2.5 credits)

Provides instruction in the use of SAS to prepare data for statistical analysis. The focus is on database management and programming problems. Discusses basic issues in each of these areas in the context of teaching specific skills required to use SAS effectively.

**BIO 200ab. Principles of Biostatistics (M. Pagano)**

Acquaints students with the basic concepts of biostatistics and their applications and interpretation. Topics include descriptive statistics, graphics, diagnostic tests, probability distributions, inference, tests of significance, association, linear and logistic regression, life tables, and survival analysis. (5 credits)

**BIO 200s. Principles of Biostatistics I (M. Testa)**

Presents the first part of introductory biostatistics, covering data presentation, numerical summary measures, rates and standardization, life tables, and sampling distributions. Introduces probability to quantify uncertainty. (2.5 credits)

**BIO 200t. Principles of Biostatistics II (C. Yiannoutsos, S. Lagakos)**

Presents the second part of introductory biostatistics, exploring inference in greater depth and emphasizing data analysis. Other topics include comparison of two means, analysis of variance, nonparametric methods, inference on proportions, contingency tables, multiple 2X2 tables, correlation, simple regression, multiple and logistic regression, analysis of survival data, and sampling theory. (2.5 credits)

**BIO 201ab. Introduction to Statistical Methods (K. Gauvreau)**

Covers basic statistical techniques for analyzing data from epidemiology, environmental health, and biomedical and other relevant research. Topics include descriptive statistics, probability, estimation and hypothesis testing, nonparametric methods, techniques for categorized data, regression analysis, analysis of variance, and study design. Designed as an alternative to BIO 200 for students desiring an emphasis on theoretical develop-

ments, or for those having had an introductory statistics course at the level of BIO 200. (5 credits)

**BIO 206s. Introductory Statistics for Medical Research (E. Orav)**

Introduces basic biostatistical techniques, emphasizing applications to clinical research. Includes concepts in probability and statistics, hypothesis testing, confidence intervals, nonparametrics, and power calculations. Designed primarily for participants in the Summer Program in Clinical Effectiveness. (2.5 credits)

**BIO 207t. Statistics for Medical Research II (G. Reed, E. Orav)**

Presents techniques that commonly appear in the analysis of clinical databases and trials. Topics include contingency table analyses, log-rank tests, paired and matched analysis, and analysis of variance and multiple comparisons procedures. (2.5 credits)

**BIO 208t. Advanced Statistics for Medical Research (E. Orav)**

Covers same topics as BIO 207t at an accelerated pace and also includes linear and logistic regression. (2.5 credits)

**BIO 209t. Translational Statistics for Medical Research (L. Sleeper, E. Orav)**

Presents techniques most relevant to researchers involved with designed experiments. Topics include contingency tables, paired analyses, simple analysis of variance, multiple

comparisons procedures, two-way analysis of variance, and simple repeated measures analysis of variance. (2.5 credits)

**BIO 210cd. The Analysis of Rates and Proportions (N. Laird, R. Glynn)**

Emphasizes concepts and methods for analysis of data that are categorical, rate-of-occurrence, and time-to-event. Stresses applications in epidemiology, clinical trials, and other public health research. Topics include measures of association, 2X2 tables, stratification, matched pairs, logistic regression, model building, analysis of rates, and survival data analysis using proportional hazard models. (5 credits)

**BIO 211cd. Regression and Analysis of Variance in Experimental Research (P. Gilbert)**

Covers analysis of variance and regression, including details of data-analytic techniques and implications for study design. Also included are probability models, computing, and the formulation of scientific questions in terms of statistical models. (5 credits)

**BIO 212cd. Survey Research Methods in Community Health (T. Mangione, S. Lagakos)**

Covers research design, sample selection, questionnaire construction, interviewing techniques, reduction and interpretation of data, and related facets of population survey investigations. Focuses

on applying survey methods to problems of health program planning and evaluation. (2.5 credits)

**BIO 213ab. Applied Regression for Clinical Research (E. Orav)**

Introduces students involved with clinical research to the practical application of multiple regression analysis. Covers linear regression, logistic regression, and proportional hazards survival models, as well as general concepts in model selection, goodness-of-fit, testing procedures, and an introduction to underlying likelihood theory. (5 credits)

**BIO 214. Principles of Clinical Trials**

**BIO 214c. (J. Ware)**

Covers types of clinical research, study design, treatment allocation, randomization and stratification, quality control, sample size requirements, patient consent, and interpretation of results. Includes the design of a clinical investigation, preparation of a protocol for the investigation, and critiques of recent medical literature. (2.5 credits)

**BIO 217t. Linear Regression and Longitudinal Analysis (J. Ware, D. Neuberg)**

Introduces multiple linear regression and linear models for longitudinal data. Explains the concepts and statistical principles underlying linear regression analysis, describes methods for multiple regression analysis, and introduces the use of linear models in the analysis of longitudinal data. (2.5 credits) Not offered summer 2000.

**BIO 219ab. Statistical Methods for Health Policy and Management (M. Testa)**

Offers introduction to probability and statistics, with emphasis on their application to health care research contexts. Topics include descriptive statistics, probability and probability distributions, sampling distributions, experimental design and sampling methods, confidence intervals, hypothesis testing and p-values, power, nonparametric methods, and an introduction to sample linear regression. (5 credits)

**BIO 222ab. Basics of Statistical Inference (P. Catalano)**

Concentrates on probability theory and mathematical statistics underlying techniques in public health research. Topics include probability distributions, means, variances and expected values, finite sampling dis-

tributions, parameter estimation, confidence intervals, and hypothesis testing. (5 credits)

**BIO 223cd. Applied Survival Analysis and Discrete Data Analysis (R. Xu)**

Covers topics in discrete analysis and applied survival analysis. Reviews sampling plans and contingency tables for discrete data. Discrete data topics include logistic regression, exact inference, and conditional logistic regression. Survival topics include hazard, survivor, and cumulative hazard functions; Kaplan-Meier and actuarial estimation of the survival distribution; and comparison of survival using log rank and other tests. (5 credits)

**BIO 224t. Survival Methods in Clinical Research (R. Davis)**

Examines common approaches to display and analysis of survival data, including Kaplan-Meier curves, log rank tests, and Cox proportional hazards regression. Computing, using SAS, is an integral part of the course. (2.5 credits)

**BIO 225c. Multiple Regression Analysis for Health Policy and Management (S-L. Normand)**

Provides a nonmathematical approach to the use and interpretation of regression modeling in health policy and management research, with emphasis on simple linear and multiple regression, including the analysis of variance. (2.5 credits)

**BIO 226ab. Applied Longitudinal Analysis (G. Fitzmaurice)**

Introduces modern methods for the analysis of repeated measures, correlated outcomes, and longitudinal data. Topics include analysis of correlated data, repeated measures ANOVA, random effects and growth curve models, and generalized linear models for correlated data. (5 credits)

**BIO 228b. Statistical Models and Methods in Human Genetics I**

Furnishes introduction to statistical methods for the analysis of family data, with emphasis on gene-mapping. Topics include allele frequency estimation, classical segregation and linkage analysis, multi-point linkage tests, model-free linkage analysis, general pedigree analysis, family-based association analysis, and study design for complex genetic traits. (2.5 credits)

**BIO 230ab. Probability Theory and Applications I (D. Harrington)**

Covers axiomatic foundations, frequency and personal concepts of probability, combinatorics, discrete and continuous sample spaces, independence and conditional probability, random variables, expectation operator, moments, generating functions and characteristic functions, standard distributions, transformations, sampling distributions related to the normal distribution, convergence concepts, weak and strong laws of large numbers, the central limit theorem, and elements of stochastic processes. (5 credits)

**BIO 231cd. Statistical Inference I (M. Zelen)**

Discusses principles of data reduction, describes methods of point and interval parameter estimation and the small- and large-sample properties of estimators, and covers methods of hypothesis testing and optimality properties of tests. (5 credits)

**BIO 232ab. Methods I (M. Wand)**

Introduces common statistical models and methods for data analysis, including concepts of populations and samples, contingency tables, and the Bernoulli and Poisson distribution models. Other topics include methods for data analysis, including chi-square tests, one- and two-sample t-tests, linear rank tests, correlation, ANOVA, and simple linear regression. (5 credits)

**BIO 233cd. Methods II (M. Hughes)**

Focuses on analysis of categorical and count data and introduces methods for analysis of survival data. Covers sampling plans, analysis of contingency tables, construction of confidence intervals and hypothesis tests, measures of association, logistic regression, and log-linear analysis. Includes survival topics such as estimation of survival distributions, comparison of groups, and regression models. (5 credits)

**BIO 235cd. Regression and Analysis of Variance (F. Vaida)**

Presents advanced topics in data analysis for linear models, including regression and analysis of variance. Other topics include theoretical and data analysis perspectives on estimation methods and issues of inference. (5 credits)

**BIO 240cd. Sample Surveys (A. Zaslavsky)**

Covers methods for design and analysis of sample surveys, including questionnaire design and evaluation. Covers estimation methods and variance estimation methods. (2.5 credits) Not offered 2000-01.

**BIO 243a. Nonparametric Methods (D. Wypij)**

Introduces nonparametric methods, including permutation tests, permutation limit theorems, 2-sample rank tests and their asymptotic efficiency, k-sample rank tests, 1-sample tests of location, paired comparisons, rank tests for symmetry, and independence. (2.5 credits) Not offered 2000-01.

**BIO 244ab. Analysis of Failure Time Data (L. J. Wei)**

Discusses the theoretical basis of concepts and methodologies associated with survival data and censoring, nonparametric tests, and competing risk models. Develops much of the theory by using counting processes and martingale methods. (5 credits)

**BIO 245ab. Analysis of Multivariate and Longitudinal Data (D. Wypij)**

Presents classical and modern approaches to the analysis of multivariate observations, repeated measures, and longitudinal data. Topics include the multivariate normal distribution, estimation of the mean and covariance matrix, Hotelling's T<sub>2</sub>, MANOVA, the multivariate linear model, and random effects and growth-curve models. Discusses computational issues for traditional and new methodologies. (5 credits)

**BIO 247cd. Design of Scientific Investigations (V. De Gruttola)**

Covers aspects of statistical theory and practice relevant to the design of health-related scientific investigations. Topics include sample size considerations, basic principles of experimental design, block designs, factorial experiments, response surface modeling, clinical trials, adaptive designs, cohort studies, early detection trials, and double-sampling techniques. (5 credits)

**BIO 248cd. Advanced Statistical Computing (R. Gray)**

Presents computing algorithms useful in statistical research and advanced applications. Topics include computer arithmetic, matrix algebra, numerical optimization methods with application to maxi-

mum likelihood estimation and GEEs, spline smoothing and penalized likelihood, numerical integration, and random number generation and simulation methods. (5 credits)

**BIO 249ab. Bayesian Methodology in Biostatistics (J. Ibrahim)**  
Introduces the fundamentals of the Bayesian paradigm, including Bayes's theorem, the likelihood principle, prior distributions, posterior distributions, and predictive distributions. Topics include Bayesian analysis of linear models, generalized linear models, survival models, random effects models, Bayesian methods in meta-analysis, and design and analysis of clinical trials. (5 credits)

**BIO 250ab. Probability II (R. Gray, S. Lagakos, L. J. Wei)**  
Looks at more advanced topics in probability theory, including measure theory integration, convergence on sequences of random variables and stochastic processes, limit theorems, projections, and conditional expectation. (5 credits)

**BIO 251cd. Statistical Inference II (L. Ryan)**  
Considers advanced topics in statistical inference. Topics include limit theorems, multivariate delta method, properties of maximum likelihood estimators, saddlepoint approximations, asymptotic relative efficiency, robust and rank-based procedures, resampling methods, and nonparametric curve estimation. (5 credits)

**BIO 262ab. Statistical Problems in Drug Development (M. Testa)**  
Introduces applications of statistical methodology required for the various phases of pharmaceutical drug development. Features guest lecturers from the pharmaceutical industry. (2.5 credits) Not offered 2000–01.

**BIO 263cd. Computational Methods for Categorical Data Analysis (C. Mehta)**  
Studies nonparametric methods of inference for a variety of problem types, using fast numerical algorithms to permute the observed data and derive exact distributions for test statistics of interest. (2.5 credits) Not offered 2000–01.

**BIO 265c. Nonlinear Repeated Measure Models (Y. Wang)**  
Covers recent methodological developments for nonlinear modeling of data consisting of repeated measurements on a number of individuals, including parametric, nonparametric, semiparametric, and Bayesian approaches. (2.5 credits)

**BIO 266d. Design and Analysis of Animal Bioassay (L. Ryan, P. Catalano, P. Williams)**  
Provides a foundation for methodologic research in bioassay design and analysis. Emphasizes statistical issues in rodent carcinogenicity, developmental toxicity, and neurotoxicity bioassays. (2.5 credits) Not offered 2000–01.

**BIO 268ab. Statistical Methods in Human Genetics (K. Lunetta)**  
Introduces statistical procedures for investigating inheritance in humans, and methods for human gene-mapping, including family-based tests of association and linkage. (2.5 credits) Not offered 2000–01.

**BIO 269b. Statistical Methods in Psychiatry (S-L. Normand, G. Fitzmaurice)**  
Covers assessment of inter-rater reliability, analysis of repeated measures experiments, methods for handling dropouts and missing data, measurement error models, ROC curves, and methods of segregation and linkage analyses. (2.5 credits) Not offered 2000–01.

**BIO 270ab. Statistical Science Outreach (M. Zelen, S-L. Normand, L. J. Wei)**  
Aims to broaden the background of students in probability and statistics. Students give short presentations from expository articles and papers chosen on the basis of ideas rather than technical content. (2.5 credits) Not offered 2000–01.

**BIO 271ab. Statistical Computing Environments (M. Pagano)**  
Acquaints students with modern computing environments in the field of biostatistics. Topics include programming environments in statistics, algorithmic and symbolic mathematics, source language programming and its tools, editors, typesetters, Internet tools, and UNIX. (2.5 credits)

**BIO 274cd. Applied Stochastic Processes and Models in Public Health (M. Zelen)**  
Develops aspects of stochastic processes that are relevant for modeling important problems in public health. Topics include Poisson processes, birth and death processes, Markov chains and processes, and semi-Markov processes. (5 credits) Not offered 2000–01.

**BIO 275ab. Operational Mathematics (R. Betensky)**  
Aims to strengthen background in analysis and operational use of mathematics. Topics include concepts of convergence, functions, integration, operations convergence theorem, and complex variables. (2.5 credits)

**BIO 276cd. Sequential Analysis (R. Betensky)**

Introduces the methods of sequential analysis for hypothesis testing and estimation, defines Brownian motion and the related normal random walk, and presents general concepts of continuous time versus discrete time monitoring and rejection of the null versus "acceptance" of the null. Also includes the sequential probability ratio test, the related O'Brien-Fleming test, the repeated significance test, and the related Pocock test. (2.5 credits) Not offered 2000–01.

**BIO 277d. Computational Biology (W. Wong)**

Presents quantitative methods used in the analysis of several types of databases. Topics may include restriction maps, cloning, genome-mapping, sequence assembly, sequence alignment, and trees and consequences. (2.5 credits)

**BIO 278a. Regression with Nonnormal Data (S. Adak)**

Introduces generalized linear models as a unifying framework for commonly used statistical methods such as multiple regression, logistic regression, and Poisson regression. Develops likelihood inference using the exponential family of distributions, discusses extensions to quasi-likelihood methods, and covers nonparametric models in which the "linear" assumption of generalized linear models can be relaxed. (2.5 credits) Not offered 2000–01.

**BIO 279d. Smoothing in Biostatistical Modeling (M. Wand)**  
Looks at some of the main smoothing techniques by which nonlinear structure can be incorporated into a statistical model without the need for parametric modeling. Discusses computational and some theoretical issues, using the computing package S-PLUS. (2.5 credits)

**BIO 284b. Spatial Statistics for Health Research (L. Ryan, M. Wand)**  
Offers introduction to topics in spatial statistics, including types of spatial data, kriging, parametric and nonparametric methods, and tests for spatial randomness. Students become proficient in the use of S-PLUS SpatialStats and ARCGView software. (2.5 credits) Not offered 2000–01.

#### Independent Study

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or undertake special projects in the following areas: statistical methods; teaching of biostatistics; consultation; computing; study design; and data analysis.

### Department of Cancer Cell Biology

**CCE 204ab. Principles of Toxicology (R. Schiestl, D. Wolf, D. Milton)**

Emphasizes mechanisms of injury and clinical consequences following exposures to environmental and occupational chemicals. Examines actions at the molecular, cellular, organ system, and organismal levels. Discusses methods for detecting, evaluating, analyzing, and combating toxic effects. (5 credits)

**CCB 210ab. Introduction to Cancer Biology (C. Maki, K. Kelsey, Z. Yuan)**

Focuses on current experimental approaches to studying cancer biology and the process of carcinogenesis. Topics include the biology of cell modification and differentiation, the phenotype of the cancer cell, properties of human and animal cancers, the process of cell transformation, mutagenesis, carcinogen metabolism, and cancer epidemiology. (5 credits)

<b>CCB 225cd. Genetic Toxicology (L. Samson)</b> Explores the biological consequences of the interaction of DNA-damaging agents with the genome. Topics include DNA structure, DNA repair, DNA damage-inducible processes, mutagenesis and mutational spectra, cell death by apoptosis, and genetic toxicity testing. (5 credits) Not offered 2000-01.	<b>EH 205ab. Human Physiology (R. Banzett)</b> Introduces the function of the human organism. Emphasizes the concept of homeostasis and the integrative aspects of physiology. Includes some pathophysiology. (5 credits)	<b>EH 235ab. Epidemiologic Basis of Occupational Health Standards (E. Eisen, D. Wegman)</b> Looks at the scientific basis for the association of occupational exposures and disease. Emphasizes the evaluation of epidemiologic literature, the interface of science and regulatory policy, and the role of risk analysis in setting health standards. (5 credits)	<b>EH 257ab. Water Pollution (T. Ford, J. Shine, R. Mitchell)</b> Presents the basic principles of water pollution and related issues on local, regional, and global scales. Discusses the chemical, physical, and biological properties of water and contaminants in ground, surface, brackish, and marine waters. (5 credits)
<b>CCB 250cd. Cell Response to Mutagens and Carcinogens (B. Demple)</b> Examines emerging research on the molecular effects of mutagenic, carcinogenic, and cytotoxic agents, with particular emphasis on cellular mechanisms that preserve biological integrity or mediate cellular responses to stress. (5 credits)	<b>EHE 215. Environmental and Occupational Epidemiology</b> <b>EHE 215cd. (D. Dockery, R. Hauser)</b> Reviews methods used to evaluate the health effects of exposure to physical and chemical agents in the environment and presents policy questions raised by the scientific evidence. Topics include methodology, review and criticism of current literature, and specific environmental and occupational health issues of current interest. (2.5 credits)	<b>EH 241cd. Occupational Safety (A. Mangone, T. Smith)</b> Furnishes overview of principles of occupational safety, including safety regulation and standards, models of accident causation, investigation procedures, and techniques for accident control. (2.5 credits)	<b>EH 262ab. Introduction to the Work Environment (R. Herrick)</b> Covers key aspects of industrial hygiene, including recognition, evaluation, and control of health hazards at work. Considers chemical, physical, and biological hazards, and the criteria for each. Includes one or more workplace visits. (2.5 credits)
<b>CCE 280cd. Biomarkers in Cancer Research (K. Kelsey)</b> Covers the use of biomarkers as measures of exposure, absorbed dose, biological effect, and health outcome in preneoplastic and neoplastic disease states. (2.5 credits)	<b>EH 223ab. Advanced Respiratory Physiology (J. Butler)</b> Covers lung structure, volume and flow mechanics, surfactant function, gas exchange, and lung and chest-wall interaction. Presents classic concepts and recent advances. (5 credits)	<b>EH 243ab. Ergonomics and Human Factors (J. Dennerlein, R. Herrick, T. Courtney)</b> Emphasizes the design of the job "to fit the worker." Investigates specific problems resulting from the nature of the job itself and considers the physiological, biomedical, psychological, and anatomical characteristics of the worker in the development of good job design principles. (2.5 credits)	<b>EH 263cd. Analytical Chemistry and Exposure Assessment (J. Shine, H. Suh)</b> Emphasizes first water and then air, requiring students to design and implement field investigations to assess human exposures to environmental pollutants in occupational or community settings. (5 credits) Not offered 2000-01.
<b>Independent Study</b> Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or to undertake specialized readings or studies in molecular, cellular, biochemical, and environmental toxicology.	<b>EH 225cd. Advanced Topics in Physiology (J. Fredberg, J. Paulauskis)</b> Allows students to focus on special topics in lung biology—for academic year 2000-01 the topic will be the fundamental physical basis and quantitative description of chemical, electrical, and mechanical signaling within the cell. (5 credits)	<b>EH 250cd. Protecting Workers from Hazardous Substances (S. Rudnick, K. Martin, R. Spielvogel)</b> Covers the recognition, evaluation, and control of workers' exposure to chemical and physical agents during remediation of hazardous sites, emergency response activities, and related operations. (2.5 credits)	<b>EH 264cd. Water Environment (J. Harrington)</b> Provides students with an understanding of water engineering principles, emphasizing design and treatment of water supply systems in developing and developed countries. (2.5 credits)
<b>Department of Environmental Health</b>	<b>EH 231cd. Occupational Health Policy and Administration (D. Christiani, C. Langer)</b> Examines legal, economic, and political foundations of occupational health activities in the United States. Discusses roles of government, unions, research organizations, and corporations. (2.5 credits)	<b>EH 253cd. Ventilation and Indoor Air Quality (S. Rudnick, J. Spengler, L. DiBerardinis)</b> Discusses industrial ventilation to control workers exposure to airborne contaminants, HVAC systems, and indoor environmental quality assessment of buildings and residences. (5 credits)	<b>EH 266cd. Land Environment and Waste Management (M. First)</b> Focuses on the nature, sources, and amounts of municipal, industrial, and hazardous wastes; laws governing storage, environmental control, transport, and disposal; waste management, minimization, elimination, recycling, and intermedia transfers, ground to water and ground to air. (2.5 credits)
<b>EH 201b. Introduction to Environmental Health (J. Brain)</b> Analyzes health problems stemming from contamination of air, water, food, the workplace, and other special environments. Examines policy required for regulation and strategies for prevention and control. (2.5 credits)	<b>EH 232cd. Introduction to Occupational and Environmental Medicine (H. Hu, D. Christiani)</b> Reviews diagnosis and management of illnesses following exposure to specific workplace substances and community hazards, such as asbestos, lead, organic solvents, and vibration. Presents techniques for assessing disability. (2.5 credits)	<b>EH 254cd. Evaluation and Control of Noise and Vibration (S. Rudnick)</b> Reviews the fundamentals, principles, evaluation, and control of noise and vibration. (2.5 credits) Not offered 2000-01.	<b>EH 267cd. Industrial Hygiene/Ergonomics Internship and Environmental Sciences Research Seminar (R. Herrick, P. Kouraklis)</b> Refines communication skills of students who have participated in the industrial hygiene internship (EH 273ab). (2.5 credits)
<b>EH 202d. Principles of Environmental Health (R. Monson)</b> Focuses on the assessment of risk to health from environmental exposures, the use of such data in policy development and environmental management, and legal strategies for redressing environmental injury and controlling environmental degradation. (2.5 credits)	<b>EH 256cd. Introduction to Aerobiology (H. Burge, D. Milton, M. Muilenberg)</b> Emphasizes the microbiology of the air, including the nature of organisms producing aerosols, the nature of aerosols and the dynamics of aerosol populations, and exposure assessment issues. (2.5 credits)		

**EHE 268b. Respiratory Epidemiology (D. Dockery)**

Reviews the epidemiology of chronic respiratory diseases; discusses demographic distribution, time trends, and risk factors. (1.25 credits)

**EH 269cd. Exposure Assessment for Environmental and Occupational Epidemiology (T. Smith, H. Suh)**

Reviews methods used to characterize environmental and occupational exposures. Introduces approaches for matching biologically based exposure assessment to epidemiologic designs. (2.5 credits) Not offered 2000-01.

**EH 270ab. Principles of Pollution Prevention (R. Pojasek, J. Spengler)**

Features group approach to learning creative, problem-solving techniques to the prevention of pollution. Students learn how to prepare a process map and use it as a template for tracking material use and loss. (5 credits) Not offered 2000-01.

**EEB 271d. Advanced Regression Techniques for Environmental Epidemiology (J. Schwartz, W. Huang)**

Covers nonlinear exposure-response relationships and repeated measure designs, including smoothing techniques, generalized additive models, robust regression, and time series models. Students use data sets to model effects of exposures on health outcomes. (2.5 credits)

**EH 273ab. Industrial Hygiene/Ergonomics Internship (R. Herrick)**

Places students in an industrial or similar workplace under the direction of an experienced industrial hygienist to learn evaluation techniques and to study a specific hazard or problem. (20 credits)

**EHE 277b. Modern Genetic Epidemiology and Gene-Mapping (X. Xu)**

Provides a comprehensive review of epidemiologic methods and study designs, family and sib pair ascertainment, gene-mapping technologies, computer software, data analysis, and interpretation. Explores innovative approaches for mapping genes of complex human diseases and addresses genetic issues underlying common human diseases. (2.5 credits) Not offered 2000-01.

**EH 278ab. Human Health and Global Environmental Change (H. Hu, E. Chivian, P. Epstein, D. Goodenough, T. Ford)**

Outlines the basic physics, chemistry, and biology of global environmental change, and of the potential consequences of these changes for human health. Topics include climate change, stratospheric ozone depletion, effects of toxic substance pollution on global ecosystems, the degradation of terrestrial and marine environments, and the loss of species and biodiversity. (5 credits)

**EH279ab. The Radiation Environment: Its Identification, Evaluation, and Control (A. Aro, J. Shapiro)**

Introduces the physics, mathematical analysis, and control of radiation fields before addressing topics selected according to the specific interests of the students. Past topics have included radiotherapy, medical imaging (x-rays, magnetic resonance, ultrasound), occupational and environmental radiation protection (radon, microwaves, ultraviolet radiation, electric and magnetic fields), and use of radiation as an analytical tool (bone-lead measurements, bone density, neutron activation analysis). (2.5 credits) Not offered 2000-01.

**EHB 281a. The Genetic Basis of Human Disease (A. Doria)**

Furnishes overview of the basic concepts of genetics and molecular biology necessary for understanding the genetic basis of disease. Covers two main topics: molecular biology and genetic epidemiology, with additional case studies. (2.5 credits)

**EH 290. Research in Physiology (J. Fredberg, J. Brain, J. Godleski)**

Focuses on the design, conduct, and analysis of research in physiology. Includes laboratory experience and the acquisition of original data. Culminates in the presentation of a research project at a national meeting and in the preparation of a paper suitable for publication. (2.5 credits)

**EH 292cd. Air Pollution: Properties of Gases and Particles (S. Rudnick)**

Covers the laws of ideal and real gases, gas properties, and application of aerosol properties to particle sampling, sizing, and collection. Topics include particle formation and deposition mechanisms, respiratory sampling, and instrumentation

for sizing and measuring airborne particles in the atmosphere. (2.5 credits) Not offered 2000-01.

**EH 295cd. Air Pollution: Atmospheric Processes, Modeling, and Energy (P. Koutrakis, J. Spengler, A. Eschenroeder)**

Employs thermodynamics theory to organize understanding of kinetics, chemical reactions, and equilibrium of air pollutants as taught in previous air pollution courses. Topics include the first and second laws of thermodynamics, chemical potential, and equilibrium. (2.5 credits) Not offered 2000-01.

**EHH 500a. Risk Assessment**

(J. Evans, J. Hammitt)

Introduces risk assessment's framework and foundations, including epidemiology, toxicology, and exposure assessment. Considers the relationship of risk assessment with cost-benefit, decision analysis, and other tools for improving environmental decisions. Discusses mathematical sciences used to develop models of dose-response, fate and transport, and the statistical aspects of parameter estimation and uncertainty analysis. (2.5 credits)

**EHH 501c. Regulatory Toxicology (G. Gray)**

Covers basic principles of toxicology and ways animal and human studies are used to further the understanding of dose-response relationships. Presents the toxicological evidence for regulating chemicals in the environment and food supply, and quantitative pharmacokinetic and dose-response models used in risk assessment. (2.5 credits)

**EHH 502d. Environmental Pollution: Exposure Modeling (J. Evans, A. Eschenroeder)**

Presents approaches for estimating human exposure to environmental pollution in situations where measurements are unavailable or uninformative. Focuses on models of the fate and transport of pollutants in air, water, and soil and considers the major routes of uptake: inhalation, ingestion, and dermal uptake. Models discussed typically include the Gaussian air pollution model, one-dimensional advection-dispersion models of groundwater, multi-compartment models such as fugacity and pharmacokinetic models, and source-receptor models. (2.5 credits)

**EHH 503ab. Environmental Science and Risk Management Practicum (ESRM) (J. Evans)**

Enables ESRM students to integrate what they have learned about risk and decision sciences and to apply this knowledge in the evaluation of a problem in environmental management or policy. Students design and conduct an independent analysis of an environmental policy problem, demonstrating analytical sophistication and critical interpretation of relevant science in support of decision making. Required for all students in ESRM master's and doctoral programs. (5 credits) Not offered 2000-01.

**EHH 505cd. Industrial Ecology and Life Cycle Assessment (J. Spengler, G. Norris)**

Investigates rationale for, methods of, findings from, and research needs within the field of industrial ecology. Focuses on product-based analyses and environmental life cycle assessment. Reviews recent and current applications in industry and government, as well as active research in the United States and internationally. (2.5 credits)

**EH 506ab. Advanced Seminar in Aerobiology (D. Milton, H. Burge)**

Allows students to analyze data for investigation of aerobiology, bioaerosol exposure assessment, or bioaerosol exposure-response relationships. Presentations of students' work, research proposals, or critical reviews of current literature. (2.5 credits)

**Independent Study, Field Experience**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or to undertake specialized readings or studies in the following areas: aerosol technology, air pollution control, environmental health management, environmental epidemiology, environmental microbiology, industrial hygiene and ventilation, nuclear medicine, occupational medicine, radiological health, respiratory biology, respiratory epidemiology, and solid waste management. Supervised site visits and field research projects are available in medical, industrial hygiene, and environmental health departments of industries and governmental agencies.

## Department of Epidemiology

### EPI 200. Principles of Epidemiology

EPI 200a. (S. Hankinson, M. Stampfer)

EPI 200s. (A. Hofman)

Introduces basic principles and methods of epidemiology. Lectures are complemented by seminars devoted to exercises or to the discussion of current epidemiologic studies. (2.5 credits)

### EPI 201a. Introduction to Epidemiology (J. Robins, K. Chan)

Covers principles and methods used in epidemiologic research. Designed for students majoring in epidemiology or biostatistics, or who desire a more detailed introduction to the main issues encountered in the design, implementation, and analysis of epidemiologic studies. (2.5 credits)

### EPI 202. Elements of Epidemiologic Research

EPI 202b. (D. Spiegelman, M. Mittleman)

EPI 202t. (M. Mittleman)

Introduces elements of study design, data analysis, and inference in epidemiologic research. May serve as an introduction to more advanced study or as a concluding course for those desiring a working knowledge of epidemiologic methods. (2.5 credits)

### EPI 203c. Design of Case-Control and Cohort Studies (A. Walker, A. Ascherio)

Examines common problems in the design, analysis, and interpretation of observational studies. Considers problems of exposure and disease definitions, time-dependent effects, confounding, and misclassification and introduces relevant statistical methods. (2.5 credits)

### EPI 204d. Analysis of Case-Control and Cohort Studies (C. Hsieh, K. Joshipura)

Develops material presented in EPI 203c into the rationale and methodology for mathematical modeling of study parameters. Emphasizes Poisson and logistic regression. (2.5 credits)

### EPI 205ab. Practice of Epidemiology (E. Rimm, M. Stampfer)

Requires students to present and discuss plans for collection and analysis of epidemiologic data. Preparatory work is done under tutorial arrangements with mem-

bers of the faculty. Emphasizes conceptual issues rather than execution. (2.5 credits)

### EPI 207a. Advanced Epidemiologic Methods (J. Robins, M. Hernan)

Provides in-depth investigations of statistical methods for drawing causal inferences from observational studies. Defines informal epidemiologic concepts such as confounding, comparability, overall effects, direct effects, intermediate variables, and selection bias within the context of a counterfactual causal model. Emphasizes methods for the analysis of causal effects of time-varying exposures in the presence of time-dependent covariates that are simultaneously confounders and intermediate variables. (2.5 credits)

### EPI 208st. Introduction to Clinical Epidemiology (D. Singer, E. Cook)

Covers principles and methods used in traditional and clinical epidemiologic research. (5 credits)

### EPI 212a. Epidemiology of Cardiovascular Diseases (M. Stampfer)

Reviews the epidemiology of coronary heart disease and stroke. Presents demographic distribution and time trends of these diseases and discusses known risk factors. (1.25 credits)

### EPI 213c. Epidemiology of Cancer (S. Hankinson, E. Giovannucci)

Offers a review of basic concepts and issues central to cancer epidemiology. Considers the descriptive epidemiology of cancer and discusses implications of the biology of cancer for identification of risk factors. Examines the role of smoking, radiation, nutrition, and other exposures. (2.5 credits)

### EPI 214d. Epidemiologic Analysis of Outbreaks and Infectious Diseases (R. Platt)

Discusses the use of epidemiologic methods in analyzing outbreaks and investigating infectious diseases. Illustrates different types of problems and methods of analysis and stresses literature review and practical methodology. (2.5 credits)

### EPI 216d. Epidemiology in Public Health Practice (R. Dicker)

Teaches the principles and practice of field epidemiology through a series of case studies. Focuses on resolving conflicts between epidemiologic theory and practical

considerations that can arise while addressing public health problems in the community. (2.5 credits)

### EPI 217a. The Epidemiology of Adult Psychiatric Disorders (P. Wang, M. Tsuang)

Covers classical and recent readings on the occurrence and distribution of psychiatric illness. Describes the application of basic epidemiologic research designs to the study of psychiatric conditions. (2.5 credits)

### EMH 218d. Environmental and Social Risk Factors for Psychiatric Disorders (S. Buka, J. Murphy, L. Berkman)

Reviews research methodology and empirical studies of genetic and psychosocial risk factors for psychiatric disorders. Topics include prenatal risk factors, childhood trauma, social networks and social support, ethnicity and religion, gender and mental health, and psychosocial risk factors. (1.25 credits)

### EPI 219b. Assessment Concepts and Methods in Psychiatric Epidemiology (D. Blacker)

Presents the application of basic epidemiologic and psychometric concepts and methods in psychiatric research. Topics include measurement theory, reliability, validity, screening, and diagnostic classification procedures. (2.5 credits)

### EPI 220d. Diagnosis in Clinic and Community Programs (G. Zornberg, J. Murphy)

Focuses on interview schedules designed to diagnose psychiatric disorders in clinical settings and household surveys. Provides practical experience in differential diagnosis, in the administration of different kinds of interview schedules, and in analysis of responses. (2.5 credits) Not offered 2000-01.

### EPI 221b. Pharmacoepidemiology (A. Walker)

Covers inference about the effects of pharmaceuticals from case reports, case series, vital statistics and other registration schemes, cohort studies, and case-control studies. Discusses decision making with inadequate data from the perspectives of manufacturers and regulators. (2.5 credits)

### EPI 222d. Genetic Epidemiology of Diabetes and Its Complications (A. Krolewski, J. Warram)

Uses the genetics of diabetes and its complications, together with the descriptive epidemiology of these conditions, to illustrate the process of generating etiologic hypotheses that can be studied by the methods of genetic epidemiology. (2.5 credits)

### EPI 224a. Cancer Prevention (G. Colditz)

Introduces cancer prevention and control from a broad range of disciplines. Covers epidemiology and biology of cancer, approaches to prevention through behavior change, and models of behavior change. Emphasizes importance of population-wide strategies rather than high-risk approaches. (2.5 credits)

### EPI 225c. Epidemiology of Infectious Diseases (M. Lipsitch)

Covers basic concepts and issues central to the epidemiology of infectious diseases. Topics include properties of infectious agents and the nature of host defenses, the dynamics of occurrence of communicable diseases, and the relation between human behavior and the actions of governments. (2.5 credits)

### EPH 227d. Principles of Screening (G. Colditz, B. Rockhill)

Provides a basic understanding of the principles of disease screening. Emphasizes screening for cancer and applications in other settings. Discusses controversies and limitations of screening strategies. (2.5 credits)

### EPI 228ab. Oral Epidemiology (C. Douglass, K. Joshipura)

Discusses the principal measures and methods of epidemiology as they apply to oral conditions; the distribution, etiology, and risk factors for a number of these conditions; and links between oral epidemiologic data and health policy issues. (2.5 credits)

### EPI 229c. Ophthalmic Epidemiology (J. Seddon)

Outlines the epidemiology of leading causes of blindness, including cataract, macular degeneration, glaucoma, and diabetic retinopathy. Considers results from various epidemiologic study designs. (1.25 credits)

**EPI 233. Research Synthesis and Meta-Analysis Applications in Public Health and Clinical Medicine**  
**EPI 233d. (G. Colditz)**  
**EPI 233t. (M. Stoto)**  
 Reviews the principles of meta-analytic statistical methods and explores the application of these to data sets. Application of methods includes considerations for clinical trials and observational studies. (2.5 credits)

**EPI 236s. Advanced Methods in Clinical Epidemiology (E. Cook)**  
 Examines study design and analytic issues encountered in clinical research. Focuses on techniques for stratified analysis, regression modeling, and recursive partitioning. (5 credits)

**EPI 240d. Use of Biomarkers in Epidemiologic Research (S. Stuver, S. Hankinson)**  
 Looks at issues pertinent to the collection, measurement, and statistical analysis of biomarker data. Topics include study-design considerations, sample storage, sources of laboratory variability, assay evolution, use of pooled samples, and repeated measures analysis. (1.25 credits) Not offered 2000-01.

**EPI 241ab. Design Issues Involved in Measuring Health Status (E. Cook)**  
 Examines methodologic issues related to measures of health status encountered in clinical research. Topics include instrument development; scaling; assessment of reliability, validity, and responsiveness to change; principal component analysis and factor analysis. (2.5 credits)

**EPI 242ab,cd. Seminar in Clinical Epidemiology (D. Singer, E. Cook, J. Orav)**  
 Serves as a forum for students' clinical epidemiological research. Exposes students to a variety of research designs, analytic strategies, and content areas. (2.5 credits)

**EPI 244c. Methods for Studying Genetic Factors in Psychiatric Epidemiology (S. Santangelo, P. Van Eerdewegh, M. Tsuang)**  
 Presents classical and current research methodology for genetic epidemiologic studies of complex (non-Mendelian) disorders. Topics include issues in phenotype definition and design and analysis of family, twin, and adoption studies. (2.5 credits)

**EPI 247b. Epidemiologic Methods Development: Past and Present (M. Mittleman)**  
 Provides students with an understanding of the theoretical basis of currently used epidemiologic methods and helps students acquire an understanding of the process of developing new approaches. (2.5 credits)

**EPI 249a. Molecular Biology for Epidemiologists (I. DeVivo)**  
 Offers an overview of molecular biology and presents molecular biological techniques commonly used in the laboratory and in epidemiological research. Topics include the structure of DNA and genes, DNA replication, transcription, and RNA translation. (2.5 credits)

**EPI 250b. Molecular Epidemiology of Cancer (F. Li)**  
 Gives an overview of the molecular genetics and epidemiology of cancer, emphasizing the use of new laboratory techniques in epidemiologic studies. (1.25 credits)

**EPI 251c. Studies in Molecular Epidemiology (D. Hunter)**  
 Acquaints students with recent developments in molecular epidemiology, including molecular markers of environmental exposures, applications to risk assessment, and genetic markers of susceptibility. Applications cover cancer, cardiovascular disease, and infectious diseases. (1.25 credits)

**EPI 252d. Infections and Cancer (N. Mueller, S. Stuver)**  
 Reviews the epidemiology and public health impact of viral and other infectious agents associated with malignancy. Discusses the role of host response and the use of serology and viral probes as risk markers. (2.5 credits)

**EPB 253c. Information Management and Data Resources in Epidemiology (K. A. Chan, M. Testa)**  
 Introduces students to the theory and applications of information technology used in modern epidemiology. Describes pertinent concepts of relational database theory and structured query language. (2.5 credits)

**EPI 254d. The Epidemiology of Aging (F. Grodstein)**  
 Covers epidemiological concepts and methods related to diseases of aging as well as general health issues in the elderly. Topics include the epidemiology of Alzheimer's disease and pharmacoepidemiology in the elderly. (1.25 credits)

**EPI 255a. Epidemiology of HIV Infection I: Etiology, Natural History, and Transmission (G. Seage)**  
 Designed for students with a keen interest in both HIV/AIDS and epidemiologic methods. Surveys state-of-the-art knowledge of the epidemiology of HIV infection and emphasizes epidemiologic principles and methods, including the etiology of AIDS and estimation of its incidence and prevalence. (2.5 credits)

**EPI 256b. Epidemiology of HIV Infection II: Design and Conduct of Therapeutic and Prevention Interventions (G. Seage)**  
 Offers additional epidemiologic principles and methods, including the design and conduct of ethical HIV intervention trials. Also reviews use of appropriate study designs and potential sources of bias. (2.5 credits)

**EPI 260d. Mathematical Modeling of Infectious Diseases (M. Lipsitch)**  
 Covers selected topics in the use of dynamical models to study the transmission dynamics and within-host population dynamics of infectious diseases. Designed for students who want to develop models for their own work. (2.5 credits)

**EPI 269cd. Epidemiologic Research in Obstetrics and Gynecology (B. Harlow, D. Cramer)**  
 Emphasizes the clinical and physiological underpinnings of the methods and results from epidemiologic research in the areas of contraception, infertility, pregnancy, menopause, and both benign and malignant gynecological conditions. (2.5 credits)

**EPI 283f. Topics in Cancer Epidemiology (N. Mueller)**  
 Reviews key papers in cancer epidemiology, emphasizing issues in hypothesis testing, study design, and integration of biological markers. (1 credit)

**EPI 284c. Epidemiology of Neurologic Diseases (A. Ascherio, A. Hofman)**  
 Reviews current papers of interest in cancer epidemiology that illustrate issues in hypothesis testing, study design, and integration of biologic data in addressing research questions. (2.5 credits)

**EPI 286t. Implementing Prevention (G. Colditz, K. Emmons)**  
 Examines the sources of evidence and the ways these sources are synthesized for informing recommendations for prevention. Reviews methods for research synthesis and the classification scheme used by the U.S. Preventive Services Task Force. (2.5 credits)

**EPI 310. Research in Clinical Epidemiology (E. Cook)**  
 Fulfills the clinical research requirement for students concentrating in clinical epidemiology who intend to complete the requirements for the SM during summer study. The research project is determined by the faculty member assigned as principal adviser to the student. (Credit to be arranged)

**EPI 355d. Advanced Seminar in Breast Cancer Epidemiology (G. Colditz, S. Hankinson, B. Rockhill)**  
 Covers current topics in breast cancer research in discussions led by expert scientists in the field. (2.5 credits)

**Independent Study**  
 Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or to undertake specialized studies in the following areas: neoplastic diseases, cardiovascular disease, clinical epidemiology, molecular and genetic epidemiology, environmental epidemiology, occupational epidemiology, infectious diseases, epidemiologic methods, nutritional epidemiology, virus-associated chronic disease/AIDS, psychiatric epidemiology, pharmacoepidemiology, oral and dental health epidemiology, and reproductive epidemiology.

## Department of Health and Social Behavior

### HMP 200c. Social and Behavioral Dimensions of Public Health (L. Kubzansky, S. Buka)

Introduces methodology to explore fundamental social and behavioral science concepts and theories useful in understanding social influences on health status. Emphasizes quantitative and qualitative research methods in social sciences applied to observational and intervention-oriented studies. (2.5 credits)

### HSB 201. Society and Health

#### HSB 201a. (I. Kawachi)

#### HSB 201s. (L. Berkman)

Analyzes major social variables that affect population health: poverty, social class, gender, race, family, community, work, behavioral risks, and coping resources. Examines health consequences of social and economic policies and the potential role of specific social interventions. (2.5 credits)

### HSB 202a. Innovative Strategies in Health Education (R. Rudd)

Focuses on selected social and behavioral change theories and the translation of these into specific health education applications. Case examples of health programs designed to address health issues and social inequalities add to the analytic process. (2.5 credits)

### HSB 204b. Communication in Health Care Settings (L. Daltroy)

Concentrates on theory and practice of health education in the clinical encounter: doctor-patient communication, patient education, adherence to medical regimen, and cognition and behavioral skills in chronic disease co-management. (2.5 credits)

### HSB 205a. Teaching and Working with Groups (R. Rudd)

Uses role play and reflective analysis to help participants develop listening skills, experiment with activities that build group cohesion and trust, and focus on group maintenance as well as task-oriented roles. (2.5 credits) Not offered 2000-01.

### HSB 206d. HIV, Transmission, and Social Behavior (S. Gortmaker)

Analyzes behavior in light of the HIV epidemic in the United States. Covers stigma, taboo, identity, sexual and drug-using behaviors, and the social construction and produc-

tion of behavior. Considers both proximal and distal behavioral risks for HIV transmission. (2.5 credits)

### HSB 207b. "Race" and Racism

Explores the roles of "race" and racism in relation to health outcomes in the United States. Topics include the history of the concept of "race," the use of "race" in scientific research, and the role of "race" as a social risk factor. (2.5 credits) Not offered 2000-01.

### HSB 211ab. Health Promotion Through the Mass Media (W. DeJong)

Covers the development of public communication campaigns in the field of health promotion: assessing the mass media's potential for health promotion, designing mass communication materials consonant with behavioral science principles and the public health model, and strategic planning for integrated mass media campaigns. (2.5 credits)

### HSB 212cd. Developing Radio Communications (B. Austin, L. Berkman)

Reviews the development and use of radio communications in public health. Participants create an original radio commercial, moving from background research to scripting and final production. (2.5 credits)

### HSB 214c. Health Literacy (R. Rudd)

Focuses on linkages between health and literacy and between health and adult education theory and methods. Participants hone skills in assessing literacy demands in health communications as they engage in structured fieldwork. (2.5 credits)

### HSB 215ab. History, Politics, and Public Health: Theories of Disease Causation Across Time and Culture (N. Krieger)

Emphasizes social and scientific contexts, content, and implications of theories of disease causation from diverse periods in history and various cultures. Teaches students a historical and critical perspective of current theories of disease causation. (5 credits)

### HSB 220cd. An Introduction to High-Risk Behaviors: Epidemiology, Prevention, and Public Policy (H. Wechsler)

Examines behaviors that place an individual at higher risk of morbidity and mortality. Focuses on epidemiology of smoking, alcohol abuse, drug abuse, gambling, inactivity, lack of proper nutrition, violence, accidental injury, unsafe driving, and unsafe sex. (5 credits)

### HSB 221cd. Psychosocial Theories of Health and Health Behavior (K. Emmons, L. Daltroy)

Explores theoretical approaches to health and health behavior, emphasizing the use of psychosocial theories in research. Theories include the health beliefs model, reasoned action, planned behavior, social learning, transtheoretical, prospect/risk communication, control, social support, and social networks. (5 credits)

### HSB 225d. Health and Social Policy in the Workplace (S. Heymann)

Investigates ways that workplace health and social policies create a positive or negative effect on the health and welfare of individuals, families, and communities. Topics include work by those with chronic diseases or developmental disabilities, work-family policies, welfare-to-work policies, safe workplace policies, and workplace-based health interventions. (2.5 credits)

### HSB 227cd. Planned Social Change (R. Rudd)

Introduces a disciplined and theory-based approach to program planning and evaluation. Applies social science principles to community assessment, program design, and a three-staged evaluation for health-related programs of planned social change. (5 credits) Not offered 2000-01.

### HSB 228a. Psychosocial Aspects of Aging

Presents the range of social, psychological, and ethical issues related to human aging and discusses the roles that public health could play in influencing the consequences of population aging. Topics include institutionalized perceptions of aging, productivity and vitality in late life, psychosocial intervention, and the effect of factors like social networks on elderly functioning and health. (2.5 credits)

### HSB 229e. The Future of Health Communication: New Media and Emerging Technologies (B. Glassman, K. Emmons)

Addresses key questions related to the role of new technologies in the context of major public health problems. Students learn to understand early signals from creators of new technologies, forge partnerships, develop and store information to ensure its accessibility, and design their own innovative delivery systems. (1.25 credits)

### HSB 231c. Community Intervention Research Methods (G. Sorensen)

Provides students with skills in intervention research design and methodology. Reviews phases of research for community studies, applies theoretical models to intervention and evaluation design, and links study design to intervention planning. Topics include community linkages to intervention research planning and implementation, community-originated research and participatory research methods, qualitative/formative research, evaluation design issues for intervention research, and measurement of outcomes. (2.5 credits)

### HSB 235c. Social Epidemiology (L. Berkman)

Focuses on understanding the social determinants of health, including biological and psychological mechanisms. Centers on theories, measurement, and empirical evidence related to specific social conditions and experiences, including socio-economic position, discrimination, social networks and support, work conditions, ecological-level neighborhood and community social conditions, and social and economic policies. (2.5 credits)

### HSB 240ab. Social and Behavioral Research Methods I (S. Gortmaker)

Covers aspects of social and behavioral research methods, including research design, measurement, sampling, data collection, and testing of causal theories. (5 credits)

### HSB 241cd. Social and Behavioral Research Methods II (S. Cole, L. Berkman)

Integrates methods training by providing students with the opportunity to manage and analyze "real world" data. Also provides opportunity to develop a research protocol following an NIH format, including describing the sample, measures, study design, and analytic techniques. Students prepare written proposals for field methods, budgets, and budget justifications for review according to the format of an NIH site visit. (5 credits)

### HSB 249b. Approaches to International Tobacco Control (I. Kawachi, K. Emmons)

Prepares students to apply training in epidemiology, statistics, management, and policy to the development of public health programs to curb tobacco use. Topics include

tobacco industry global structure, marketing, and political strategies. (2.5 credits) Not offered 2000–01.

**HSB 250b. Inequality and Health (I. Kawachi, B. Kennedy)**

Reviews, from economic, political, and sociologic perspectives, the major theories of social stratification; examines the epidemiologic evidence on social class, gender, and racial disparities in health and illness; and develops an interdisciplinary approach to analyzing the problem of inequality. (2.5 credits)

**HSB 269ab, HSB 270cd. Doctoral Seminar on Health and Social Behavior (S. Gortmaker)**

Outlines the major questions pursued by doctoral students in health and social behavior. (1.25 credits)

**HSB 292c. Policy Analysis Methods for Public Health (D. Acevedo-Garcia)**

Builds skills necessary to interpret results and recommendations of health research. Introduces the following policy analysis methods: decision analysis, economic analysis, and application of statistical and qualitative approaches to policy questions. Also offers introduction to policy advocacy methods. (2.5 credits)

**HSB 295d. Health and Social Policy Doctoral Seminar (J. Heymann)**

Helps doctoral students understand how the design and implementation of their research influences its utility. Examines successes and failures in the translation of research to programs and policy. (2.5 credits)

**Independent Study, Field Experience**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research, undertake specialized readings, perform field projects, or carry out independent studies.

## Department of Health Policy and Management

**HPM 201b. Pharmacoeconomics and the Economic Evaluation of Medical Technology (P. Neumann)**

Examines key issues in the use of economic information for the evaluation of pharmaceuticals and other medical technologies. Emphasizes applications of analytic techniques in a variety of disease areas. Discusses the FDA's role and the use of pharmacoeconomic information in coverage and reimbursement decisions by managed-care plans. (2.5 credits)

**HPM 202s. The Role of the Physician Manager in Health Care (E. Mort)**

Assesses the major managerial roles for physicians in the arena of health care delivery. Topics include market forces, quality improvement and re-engineering in an acute-care hospital, creation of an integrated delivery system, the changing role of payers, guideline development and implementation, and medical management under capitation. (2.5 credits)

**HPM 205ab. Economic Analysis for Public Health (M. Roberts)**

Introduces basic principles of economics and economic analysis, particularly as they apply to public health. Covers such aspects of microeconomic theory as determinants of supply and demand, the theory of markets, economic efficiency, and other topics in health care economics. (5 credits)

**HPM 206ab. Economic Analysis (D. Hemenway)**

Brings students to an intermediate-level understanding of microeconomic theory. Emphasizes the uses and limitations of the economic approach. (5 credits)

**HPP 207ab. Econometrics for Health Policy (C. Yip)**

Provides students with an understanding of econometric concepts and methods used in health policy research. Gives special attention to modeling and model specification issues. (5 credits)

**HPM 208cd. Health Care Regulation and Planning (K. Swartz)**

Examines issues for U.S. health care reform: insurance, financing, cost-control methods, incentives for hospitals and physicians, quality of care, long-term care, competitive

versus regulatory approaches, and the roles of government and the private sector. (5 credits)

**HPM 209s. The Economics of Health Policy (Y. Liu)**

Teaches the analysis of health policy issues through the application of basic economic principles. Topics include health insurance, the role of taxation and regulation in promoting public health, hospital mergers, an overview of cost-effectiveness analysis, implications of the growth in for-profit health care providers, and health care reform. (2.5 credits)

**HPM 210d. Medical Malpractice and Risk Management (B. Moulton)**

Focuses on the development, implementation, and evaluation of risk management programs and legislative reforms in patient compensation plans. Emphasizes the relationships among quality-of-care standards, quality assurance, malpractice vulnerability, and risk management programs. (2.5 credits)

**HPM 211abcd. New Developments in Health Law (T. Brennan, M. Chirba-Martin, A. Noble)**

Looks at recent developments in legal issues pertaining to public health, focusing on topical decisions, bills being debated in Congress, newly enacted statutes, issues related to medical ethics, and developments in corporate and antitrust law. (1.25 credits)

**HPM 212ab. Program Evaluation in Health Policy (J. Needleman)**

Examines issues in health program evaluation, with an emphasis on accuracy, relevance, and credibility of findings. Topics include establishment of the scope of an evaluation, evaluation design, data and measurement issues, inference, and the presentation and application of findings. (5 credits)

**HPM 213b. Introduction to Law and Public Health (A. Noble, M. Chirba-Martin, T. Brennan)**

Explores the interplay of law, public health policy, and the rights of the individual. Topics include patient confidentiality, discrimination, informed consent, and medical malpractice, placed in the context of problems like the HIV and tuberculosis epidemics, tobacco regulation, maternal and child health issues, and end-of-life decisions.

(2.5 credits)

**HPM 214cd. How to Regulate: Case Studies in Federal, State, and Local Regulation of Health Care (P. Green, A. Hyams)**

Assesses the challenges faced by federal, state, and local regulators, from defining the problems to designing the remedies and enforcing the rules. Also covers strategies for reforming existing regulations. (2.5 credits)

**HPM 217cd. Advanced Topics in Health Law and Policy (T. Brennan)**

Offers team approach in reviewing critical topics in health law, supplemented by specific case studies, and in making presentations on selected areas of health law and policy. (2.5 credits)

**HPM 219a. Financial Transactions and Analysis (N. Kane)**

Introduces concepts of financial accounting for the nonaccountant user of financial information. Focuses on basic accounting transactions, statement preparation, accrual accounting, concepts of accrual versus cash accounting, nonprofit health care accounting, and statement analysis in a variety of health care organizations. (2.5 credits)

**HPM 220b. Financial Management and Control (R. Siegrist)**

Provides introduction to cost accounting and management control concepts and their uses in health service organizations. Topics include cost accounting, management control structure and process, responsibility accounting, budgeting, reporting, and variance analysis. (2.5 credits)

**HPM 221ab. Management in Public Health in Industrialized Countries (M. Roberts, C. Koeck)**

Explores the management of health delivery organizations in industrialized countries. Topics include organizational issues, financial management, cost accounting, management control systems, and institutional strategy. (5 credits)

**HPM 222d. Financial Management of Health Care Organizations (D. Puhy, A. Harbaugh)**

Covers financial management of working capital, investment decision models, long-term capital structure, and mergers and acquisitions of health care organizations. (2.5 credits)

**HPM 223b. Public Speaking for Managers (N. Kane, P. Campbell)**  
Offers students the opportunity to develop skills in oral communication. Emphasizes techniques most useful to managers. (1.25 credits)

**HPM 224c. Analyzing National Health Policy: An International Comparative Perspective (M. Roberts, K. Donelan, C. Koeck)**  
Provides students with the skills needed to analyze proposed changes to an industrialized country's national health policies. Examines questions facing countries that relate to the control of technology, hospital investment, the supply and distribution of physicians, access to care, and the role of prevention in the financing of health care. (2.5 credits)

**HPM 225d. Legal and Ethical Issues in the AIDS Epidemic (Z. Lazzarini)**  
Examines the legal and ethical issues raised by the HIV/AIDS epidemic, including ways that social issues, such as discrimination, have influenced the epidemic, and the relative roles of voluntarism and coercion in public health strategies. Other topics include the shift in epidemiology as HIV/AIDS affects increasing numbers of women, children, and minorities and the design of prevention programs in an imperfect world. (1.25 credits)

**HPC 226e. Urban Violence in America (D. Prothrow-Stith, H. Spivak, A. Browne)**  
Takes an interdisciplinary approach to the causes and possible remedies for the epidemic of urban violence in the United States. Emphasizes the public health approach to violence prevention. (1.25 credits)

**HPM 227cd. The Economics of Health Policy (J. Newhouse)**  
Considers policy issues related to demand for medical care services, demand for insurance and issues of selection, medicare reimbursement policies, effects of health maintenance organizations and their reimbursement by medicare, malpractice, and the aggregate number and distribution of physicians. (5 credits)

**HPM 228cd. Introduction to the New American Health Care System: Law, Policy, and Management (G. Moseley)**

Analyzes the organizations, structures, and relationships intrinsic to the U.S. health care system's reformation. Identifies the key delivery entities (HMOs, PPOs, MSOs, IPAs, PHOs, and more) and their purposes, advantages, and disadvantages in the context of strategies being implemented by doctors, hospitals, insurers, and employers. Discusses the influences of federal and state government agencies. (2.5 credits)

**HPM 230cd. Managing People in Health Care Organizations (G. Moseley)**

Explains the basic systems and strategies for managing human resources in health care delivery organizations, including principles of recruitment, management, and supervision. Stresses the role of labor unions, management of staff relations, and downsizing. (5 credits)

**HPM 231c. Competitive Strategy Determination (D. Moriarty)**

Focuses on the conceptual framework needed to plan for the long-term viability of health care organizations. Students learn to appreciate the concepts of competitive strategy and competitive advantage and gain the tools and skills to formulate and evaluate organizational strategy. (2.5 credits)

**HPM 232d. Operations Management in Service Delivery Organizations and Strategies for Managing Variable Patient Demand in Health Care Settings (E. Litvak, C. Long)**

Examines the role of operations management, including understanding and evaluating the performance of operating units and designing new procedures and systems. Topics include process and capacity analyses, types of processes, productivity analysis, and operating strategy. Introduces new variability-based methodology and cost-reducing quantitative techniques. (2.5 credits)

**HPM 233d. Strategic Marketing Management in Health Systems (G. Wasek)**

Assesses marketing within a strategic framework across the public and private sectors, domestic and international health systems, and social marketing contexts. Marketing management, research, and strate-

gy techniques are discussed and applied to program design, business planning, and implementation issues. (2.5 credits)

**HPM 235b. Policy Issues in Managed Health Care: Policy and Public Management Issues (N. Turnbull)**

Reviews the concepts, programs, and policy of managed care in the context of current health care reform proposals at state and national levels. Focuses on forms that managed-care products take and their intended achievements; the ways these forms are viewed by the market; and their effect on costs, health outcomes, and buyer satisfaction. The prospect of using managed care to control national health spending and to improve access and quality of care is also discussed. (2.5 credits)

**HPM 238c. Strategic Use of Information Systems in Health Care Delivery (J. Nobel)**

Explores information systems from the perspectives of providers, payers, and consumers. Topics include computerized patient records, repository databases, clinical decision support systems, and interactive multimedia communications. (1.25 credits)

**HPM 239bcd. Applied Financial Analysis of Health Care Organizations (N. Kane)**

Builds skills by assigning students a set of health care organization financial statements to analyze as a group before breaking into smaller groups to pursue student-defined, financial research questions. (3.75 credits)

**HPM 241ab. Health Care in the U.S.: System, Policy, and Comparative Perspectives (S. Burke, J. Akula)**

Examines the organization of the U.S. health care system, the current policy debate about health care reform, and ways in which health care systems of other industrialized nations provide insight into the U.S. experience. (5 credits)

**HPC 242c. Politics and Strategies for Change in Health Policy (R. Blendon)**

Focuses on development of strategies to influence public policy in order to improve the health of populations. Topics include the politics of health care, political strategy, lobbying and special interest groups, the media and public opinion, the effects of campaigns and

elections on health care policy, coalition building, and grass-roots advocacy. (2.5 credits)

**HPM 243c. Health Economics: Economic Analysis of the Health Care System (W. Hsiao)**

Introduces health economics, the use of economic analysis to examine major health care financing and delivery issues, and the development of policies and programs designed to address them. Topics include financing, access, utilization, cost control, market structure, and national health plans. (2.5 credits)

**HPM 244d. Pharmaceutical and Biotechnology Industries: Public Policy and Regulatory Issues (J. Norris)**

Analyzes public policy and legal issues in the pharmaceutical and biotechnology industries in the United States and worldwide, stressing research and development of new biomedical products. Examines regulatory programs for new product development, the ethics of clinical investigation, and conflicts of interest. (1.25 credits)

**HPM 245f. Public Health Leadership Skills (D. Prothrow-Stith, L. Marcus)**

Provides students with concrete skills needed to lead health agencies. Topics include public speaking, articulation of goals, negotiation, budget development, and constituency building. (2.5 credits)

**HPM 246abcd. Seminar in Health Policy (J. Newhouse, R. Frank)**

Covers the financing and organization of health care, medical manpower, medical malpractice, technology assessment, prevention, mental health, long-term care, and quality of care. (10 credits)

**HPM 247cd. Political Analysis and Strategy for U.S. Health Policy (R. Blendon)**

Analyzes the politics of major health policy development in the United States and provides skills for developing strategies to influence policy outcomes. Topics include the politics of agenda setting and health care; the press, politics, and health policy; pollsters and political institutions; and health politics in the states and abroad. (5 credits)

**HPM 249cd. Development of Federal Health Policy (J. Nuzzo)**

Discusses the interplay of forces, both internal and external to government, that influence federal health policy decisions. Describes the actors and the policy development process. Develops skills in policy analysis, writing of memoranda, and government relations. (2.5 credits)

**HPM 253t. Quality Improvement in Health Care (M. Bisognano, D. Berwick)**

Investigates theoretical and practical methods for improving health care systems by presenting clinical cases, organizational lessons, interactive learning modules, and site visits to health care settings. (2.5 credits)

**HPM 255d. Payment Systems in Health Care (N. Turnbull)**

Looks at issues related to third-party reimbursement for health care institutions and individual providers. Issues include cost-containment efforts, provider and policy perspectives, and managed care. (2.5 credits)

**HPM 256c. Clinical Quality Measurement for Quality Improvement (H. Palmer)**

Introduces the terminology, concepts, methods, and strategies for clinical quality measurement in a variety of health care environments. Takes a rigorous analytic approach using epidemiologic methods. (2.5 credits)

**HPM 257c. Use of Outcomes and Patient Satisfaction in Assessing Quality of Care (S. Greenfield, S. Kaplan)**

Explores the principles and issues involved in using outcomes of care and patient satisfaction in evaluating quality of care, including an assessment of the major instruments and methods currently available. Topics include the relationship of process to outcome; the impact of setting on how outcomes are used; difference between the reporting, rating, and participating functions of the patient; and the role of provider satisfaction in outcome. (2.5 credits)

**HPM 258d. Physician Performance (L. Leape)**

Examines factors influencing physician practice, including training, experience, organizational setting, financial incentives, and patient

preferences. Considers strategies for changing physician behavior, such as education, feedback, guideline development, and utilization management. (2.5 credits)

**HPM 259. Quality Management in Health Care****HPM 259d.**

**HPM 259t. (T. Lee, R. Bohmer)** Introduces the concepts and tools of total quality management (TQM) and their applications to health care. Reviews the data needs of quality management, the implications for information system planning, and the relationship between national health care policy as it relates to quality and the application of TQM. (2.5 credits)

**HPM 262c. How to Write, Review, and Publish Articles on Medicine and Health Policy (G. Lundberg, K. Donelan)**

Teaches students to prepare, review, and revise articles for publication, while providing an overview of current health policy controversies. (2.5 credits)

**HPM 266c. Seminar on Refugee Trauma and Human Development (R. Mollica, J. Lavelle, K. Allden)**

Focuses on the public health problems of highly traumatized refugee populations. Provides a comprehensive overview of the international approach, theoretical models, and public health strategies for dealing with refugee crises. (1.25 credits)

**HPP 268c. Financing Health Care in Developing Countries (W. Hsiao, P. Berman)**

Provides an introduction to public and private financing of health care in developing countries. Analyzes economic considerations in alternative approaches to financing, reviews formal perspectives of economic theory, and assesses links between stages of national development and health care financing. (2.5 credits) Not offered summer 2000.

**HPM 269b. Comparative Health Systems of Industrialized Societies (M. Field)**

Undertakes a comparative examination of the health systems of industrial and urban societies in order to provide an understanding of shared features and critical differences. (2.5 credits) Not offered 2000-01.

**HPM 271e. Overview of Intimate Partner Violence (D. Prothrow-Stith, A. Browne)**

Covers the epidemiology of domestic violence, dynamics of abusive relationships, responses of the criminal justice and health care sectors, the role of the shelter and advocacy communities, relationships with other forms of violence, and strategies for primary prevention. (1.25 credits)

**HPM 274abcd. Oral Health Policy Research Seminar (C. Douglass)**

Concentrates in the fall term on the research methods of current national studies of the need, supply, demand, and cost of dental care. The spring term emphasizes research work on relevant dental care policy subjects. (5 credits)

**HPM 275ab. Dental Public Health and the Dental Care Delivery System (C. Douglass)**

Reviews basic concepts in dental public health and the dental care delivery systems of the United States and other countries. Examines issues of utilization of services, need versus demand, methods of quality assurance, and the role of government agencies. (2.5 credits)

**HPM 276t. A Survey of Methods and Applications in Health Services Research (A. Epstein)**

Outlines the methodology and application of health services research. Topics include research design, analyses of large databases, cost-effectiveness analyses, survey methodology, assessment of health status, assessment of quality, measurement of access to care, risk adjustment, and statistical techniques of health services research. (2.5 credits) Not offered summer 2000.

**HPM 277t. Current Issues in Health Policy (A. Epstein, A. Komaroff)**

Provides an overview of the major health policy issues facing the United States today. Focuses on roles of hospitals, doctors, private and government insurance, and different systems for organizing and financing care. (2.5 credits)

**HPM 278d, 278e. Skills and Methods of Health Care Negotiation and Conflict Resolution (L. Marcus)**

Presents the theory and practice of negotiation and conflict resolution with emphasis on integrating analytic skills, negotiation techniques,

and conflict resolution methods into the practice of public health. (1.25 credits)

**HPB 280b. Decision Analysis for Health and Medical Practices (S. Goldie)**

Discusses the methods and applications of decision analysis, cost-effectiveness analysis, and benefit-cost analysis in health care technology assessment, medical decision making, and health resource allocation. (2.5 credits)

**HPB 281c. Methods for Decision Analysis in Public Health and Medicine (K. Kuntz, M. Weinstein)**

Covers methods and applications of decision analysis and other modeling techniques to clinical problems. Topics include Markov models, life expectancy modeling, deterministic and probabilistic sensitivity analysis, simulation models, ROC analysis and diagnostic technology assessment, quality-of-life valuation, multi-attribute utility, and behavioral decision theory. (2.5 credits)

**HPB 282d. Cost-Effectiveness and Cost-Benefit Analysis in Public Health and Medicine (J. Graham, M. Weinstein)**

Teaches methods and applications of cost-effectiveness analysis and includes cost-benefit analysis for health program evaluation, medical technology assessment, and environmental risk analysis; theoretical foundations; "shadow" pricing; economic valuation of lifesaving; cost accounting; and economic evaluation of biomedical research. (2.5 credits)

**HPE 284ab. Decision Theory (J. Hammitt)**

Introduces the standard model of decision making under uncertainty and methodological issues created by applications to health research. Topics include von Neumann-Morgenstern and multi-attribute utility theory, Bayesian statistical decision theory, stochastic dominance, the value of information, judgment under uncertainty, and alternative models of probability. (5 credits)

**HPE 285d. Environmental Health Risk: Concept and Cases (K. Thompson)**

Challenges students to evaluate the risk analysis framework as an approach to managing environmental health, safety, and other standards. Addresses contemporary

issues in risk assessment, evaluation, management, and communications. (2.5 credits)

**HPM 286s. Decision Analysis in Clinical Research (M. Weinstein)**

Covers decision analysis methods relevant to clinical decision making and clinical research, the use of probability to express uncertainty, Bayes's theorem and evaluation of diagnostic test strategies, sensitivity analysis, utility theory, and cost-effectiveness analysis. (2.5 credits)

**HPM 287abcd. Research Seminar on Risk and Decision Analysis (J. Hammitt)**

Offer introduction to state-of-the-art scholarship in risk analysis and decision theory. Topics include theory and techniques of risk analysis, choice under uncertainty, health policy models, cost-effectiveness analysis, and statistical decision theory. (2.5 credits)

**HPM 288c. Management Science (E. Litvak)**

Introduces quantitative tools and methods to promote optimal use and allocation of scarce resources. Topics include linear programming, transportation, assignment, network flows, dynamic programming, queuing, and simulation. (2.5 credits)

**HPM 289cd. Practicum in Decision and Cost-Effectiveness Analysis (K. Kuntz, S. Goldie)**

Enables students to design and undertake a research project in decision analysis or cost-effectiveness analysis on a topic of their choice. (2.5 credits)

**HPM 290ab, 290cd. Applied Research and Practice in Health Policy and Management (N. Turnbull, G. Moseley, E. Litvak)**

Teaches students to apply analytic and managerial methods to concrete problems. Each student carries out a research project, conducts a policy analysis, or performs a management study on behalf of an individual or institutional sponsor. (5 credits)

**HPM 291cd. Applied Research in the Law of Health Policy and Management (T. Brennan)**

Allows students in the law and public health concentration of the MPH degree program to apply analytic skills to a practical problem. Students carry out a research project, perform a policy analysis, or con-

duct a managerial study on behalf of an individual or institutional sponsor. (5 credits)

**HPM 292d. Research Ethics (T. Brennan)**

Reviews ethical issues that arise in the conduct of research. Topics include informed consent, disclosure of conflicts of interest, multiple authorship, issues in mentoring (including gender and race-based discrimination), and federal oversight. Required for all students engaged in studies supported by the National Institutes of Health. (1.25 credits)

**HPM 294b. Methodology Issues in Health Services Research (S. Kaplan)**

Emphasizes the array of methods available to health services researchers, their disciplinary origins, underlying assumptions, and strengths and weaknesses. (2.5 credits)

**HPM 296cd. Doctoral Seminar in Health Economics (J. Newhouse, D. Cutler, R. Ellis)**

Explores frontier work in the field of health economics. Focuses on advanced theories and economic models useful for policy analysis, and on development of research topics. (2.5 credits)

**HPM 297cd. Public Opinion, Polling, and Public Policy (R. Blendon)**

Investigates the uses of public opinion polling in public policy decision making and media reporting. Students analyze and evaluate existing opinion surveys, design polling questions, and interpret public opinion results. (5 credits)

**HPE 299a. Analytical Methods in Risk and Decision Sciences (K. Thompson)**

Covers advanced methods for modeling and synthesizing information for analysis of health decision problems. Builds analytical and computational skills (with emphasis on simulation and uncertainty analysis) through the application of theory to real health and safety problems, both environmental and medical. (2.5 credits) Not offered 2000-01.

**HPC 506a. The Practice of Public Health in the United States (D. Prothrow-Stith, I. Aitken, J. Kurland, L. Marcus)**

Describes the legal, political, and structural systems established for the delivery of public health in the United States. Topics include the

role of medicine, community and civic organizations, and academia in supporting the core function of public health. (1.25 credits)

**HPM 507a. Mental Health, Policy, and Economics in the United States (M. Rosenthal)**

Introduces students to the U.S. system of financing and delivering mental health services and covers policy issues related to mental illness. Provides historical context and analysis of major issues and initiatives, including current debate over parity legislation. (2.5 credits)

**HPM 508c. Legal and Regulatory Issues in Managed Care (A. Noble, M. Chirba-Martin, T. Brennan)**

Explores how law affects health care delivery and finance with a primary focus on managed care. Examines recent developments in regulation, issues of federalism and state police power, liability issues, the effect of regulations on relationships between key stakeholders, the implications of tax status, and competing ethical and legal obligations. (2.5 credits)

**HPM 510s. Introduction to Management of Health Care Organizations (M. Roberts)**

Provides an introduction to two of the major tasks confronting managers of health care organizations. Builds on an introduction to organizational theory and focuses on the main problems of organizational strategy and the management of human resources. (2.5 credits)

**HPM 512t. Medical Informatics (D. Bates, G. Kuperman)**

Furnishes overview of medical informatics, the nature of computer-based data, and clinical systems (with a focus on clinical decision support and evaluation of their impact). Topics include large databases, the Web, confidentiality issues, information retrieval, and patient computing. (2.5 credits)

**HPM 514s. Developing Questionnaires to Measure the Outcomes of Health Care**

Emphasizes concepts, methods, and practical procedures for developing questionnaires for assessing patients' health status and the outcomes of care. Also reviews qualitative and quantitative approaches and statistical methods. (2.5 credits)

**Independent Study, Field Experience**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research, undertake specialized readings, perform field projects, or carry out independent studies.

**Department of Immunology and Infectious Diseases**

**IMI 201a. Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas (J. Maguire)**

Introduces ecological and epidemiologic concepts basic to the control of infectious agents. Considers parasitic diseases of significance in the developing areas of the world and elucidates epidemiologic principles of vector-associated diseases. (3 credits)

**IMI 202c. Tuberculosis Areas (E. Nardel, E. Rubin)**

Covers the immunobiology, aerobiology, and molecular aspects of tuberculosis that underlie diagnostic and control strategies. Includes discussions of the impact of HIV/AIDS and of drug resistance on tuberculosis control and prevention. (2.5 credits)

**IMI 204c. Survey of Immunobiology (M. Grusby)**

Examines the anatomy and physiology of the immune system, fate of antigen, cell trafficking, cellular interactions, regulation of the immune response, and B- and T-cell recognition mechanisms. Principles of immunoregulation are discussed in the context of current literature. (2.5 credits)

**IMI 205c. Clinical and Pathologic Features of Tropical Diseases (J. Maguire, F. von Lichtenberg)**

Emphasizes the clinicopathologic aspects of tropical diseases. Disease entities are reviewed through clinical cases with exposition of the pertinent clinical and pathologic features. (1.25 credits)

**IMI 206d. Principles of Public Health Entomology (A. Spielman)**

Discusses from ecological, physiological, and genetic points of view the manner in which arthropods transmit disease. Outlines the principles of vector control. Includes weekend field trips. (2.5 credits)

**IMI 208cd. Immunology of Infectious Diseases (D. Harn)**

Covers the interactions of pathogens with the host immune system, from pathogen invasion to pathogenesis. (5 credits)

**IMI 211d. The Microbiology of Public Health (P. Kanki, J. Sankale, M. Essex, T. H. Lee)**

Presents principles of virus-host interactions at a population level. Selected viral pathogens are studied that exemplify the complexities of virus infection, host response, viral transmission, and disease. Emphasizes the public health perspective of various aspects of viral infections. Introduces laboratory techniques for surveillance and diagnosis of viral infections for epidemiological studies. (2.5 credits)

**IMI 216cd. Cellular and Molecular Biology of Parasites (J. Samuelson)**

Covers aspects of cell, developmental, and molecular biology of protozoan and helminth parasites of humans. (5 credits) Not offered 2000-01.

**IMI 222d. The AIDS Epidemic: Status, Dynamics, Prospects, Conflicts (P. Kanki, M. Essex)**

Deals with a broad range of topics relating to the public health implications of the AIDS epidemic, including the virology, therapy, vaccines, and etiologic hypotheses concerning the origins of the virus. Topics include the dynamics of the epidemic, public policy issues, economic implications, and social support needs. (1.25 credits) Not offered 2000-01.

**IMI 225cd. Design and Development of a Vaccine (T. H. Lee, D. Harn, M. Essex, J. Mekalanos)**

Covers such topics as methodology for new vaccine development, including development of vaccines for specific purposes; manufacturing and quality control; techniques to ensure appropriate use of vaccines; liability issues; cost-effectiveness analysis; decision analysis for future research, development, and distribution of vac-

cines; and epidemiology of vaccine-preventable illness. (2.5 credits) Not offered 2000-01.

**Independent Study**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or undertake specialized readings or studies.

**Department of Maternal and Child Health****MCH 200b. Physical Growth and Development I (K. Peterson)**

Introduces the principles of growth assessment that are an integral part of comprehensive child health programs. Topics include the selection, measurement, and interpretation of anthropometric indicators of growth. (2.5 credits)

**MCH 201abcd. Public Health Practice in Maternal and Child Health (I. Aitken)**

Provides students with opportunities to apply quantitative skills in a field situation. Students conduct needs assessments, present data for policy decisions, and gain experience in the organization and management of public health programs. (5 credits)

**MCH 202c. Physical Growth and Development II: Seminar on Factors Affecting Growth and Development (J. Dwyer)**

Explores the basic factors that influence physical growth and development from conception to maturity, and their implications at the individual, family, community, and national levels. (1.25 credits)

**MCH 203c. Analysis of Secondary Data (M. Ganz)**

Introduces students to methods of access and analysis of relevant data sets commonly used by MCH researchers. Covers problems associated with using secondary data and the analytic methods needed to correctly test hypotheses with these data. Prepares students to perform and critique secondary data analyses. (2.5 credits)

**MCH 204ab. Maternal and Child Health Issues, Programs, and Policies (M. McCormick, L. Kleinman)**

Discusses health care programs for mothers and children in the context of growth and maturational processes, legislative background, and social, mental health, and educational policies. (5 credits)

**MCH 206a. Maternal and Child Health in Developing Countries (M. Farrell, I. Valadian)**

Focuses on designing, implementing, and evaluating projects and programs for women and children in developing countries. Emphasizes developing skills in describing the health status of women and children and using these to design programmatic interventions. Considers rapidly changing social and cultural environments and the impact of conflict and changing economies on the health of women and children. (2.5 credits)

**MCH 207ab. Nutrition in Child Growth and Development (J. Dwyer)**

Covers principles and practical problems encountered in developing policies and programs involving nutritional issues, growth, and development. Discusses general principles of nutrition as background for policy issues. (2.5 credits)

**MCH 208b. Adolescent Health (J. Kulig, B. Kennedy)**

Concentrates on adolescent health, risk behaviors, and prevention and intervention programs in relation to physical, psychosocial, and cognitive development. (2.5 credits)

**MCH 209c. Services for Children with Disabilities (A. Crocker, D. Helm)**

Looks at how service programs in the disability field are constructed, supported, and evaluated. Uses outside guests from community programs for many sessions. (2.5 credits)

**MCS 210ab. Personality and Cognitive Development: Application to Public Health (D. Kindlon)**

Examines the principles of child growth and development within a public health frame of reference. Emphasizes the theories and research of Bronfenbrenner, Skinner, and Erikson. (2.5 credits)

**MCH 211cd. Women, Health, and Development (N. Swenson)**

Addresses the major issues concerning women and their relationship to health worldwide, including ways women affect the health of families, communities, and societies. (2.5 credits)

**MCH 212ab. Developmental Disabilities I: Evaluation, Assessment, Families, and Systems (D. Helm, A. Crocker)**

Emphasizes issues facing professionals who work with people with developmental disabilities, including the professionals' role in diagnosing, evaluating, and assessing children who have developmental disabilities. (2.5 credits)

**MCH 213d. Childbirth: Health Policy and Epidemiology (B. Sachs, K. Richardson, E. Lieberman)**

Uses epidemiologic data to address perinatal health policy. Explores issues affecting childbirth services, including prenatal care, maternal health, and pregnancy complications. (1.25 credits)

**MCH 214cd. Developmental Disabilities II: Values, Policy, and Change (D. Helm, A. Crocker)**

Focuses on the community, system, and leadership components of developmental disabilities, with the goal of enhancing the quality of life of individuals with disabilities. (2.5 credits)

**MCM 215cd. Methods of Planning and Evaluating Public Health Programs (S. Buka, M. McCormick)**

Presents concepts and approaches for developing and evaluating programs and services for any health, human service, or social program. Topics include the development of knowledge and skills in needs assessment, program development, implementation, and evaluation of public health programs. (2.5 credits)

**MCN 217c. Nutritional Surveillance (K. Peterson)**

Covers theoretical and practical issues guiding the design and implementation of nutritional surveillance systems. (2.5 credits) Not offered 2000-01.

**MCH 219d. Research Methods in Maternal and Child Health (M. McCormick)**

Provides an overview of research methods appropriate to maternal and child health. Topics include the use of vital statistics, confidential perinatal inquiry, admission severity scores, child health status measures, and methods of ascertaining rare populations. (2.5 credits) Not offered 2000-01.

**MCH 220c. Society and Its Effects on Child Health (J. Palfrey, R. Samuels)**

Examines the ways that society affects children's health in the United States. Covers the effects of poverty on health and the public policy impact on chronic illness. (2.5 credits)

**MCH 222cd. Social Services for Children, Adolescents, and Families (L. Tieszen, E. Newberger, L. McCloskey)**

Presents the role of social services in maintaining and promoting the health of children and their families. Examines current political trends structuring the content and delivery of social services. (2.5 credits)

**MCE 223c. Child and Adolescent Mental Disorders: Public Health Perspectives (S. Buka, D. Kindlon, B. Mohler)**

Explores the occurrence and risk factors of mental disorders of childhood and adolescence, including drug abuse and eating disorders. (1.25 credits)

**MCH 225b. Gender-based Violence: Origins and Remedies (L. McCloskey)**

Centers on the cultural origins of gender-based violence and the public health implications and remedies. Topics include relationship violence and state-supported policies of violence against women and gays. (2.5 credits)

**MCH 232a. Physical Growth and Development III: Advanced Seminar (I. Valadian)**

Examines the stages of physical growth and development introduced in MCN 200b. Expands on maturation, its components, their assessment, and underlying neurological, biological, and chemical changes. Discusses how the sequential unfolding of maturation pro-

motes changes in health and nutrition services for individuals and populations of children. (2.5 credits)

**MCH 233d. Public Health Genetics: Contemporary Issues and Challenges (R. Blatt)**

Utilizes case studies to focus on developments in molecular biology and genetic medicine and to explore the impact on biomedical research, health care delivery, ecological systems, and public health policy and regulation. (1.25 credits)

**MCH 297ab. Leadership in Minority Health Policy (J. Reede, R. King)**

Focuses on strategies for career development in minority health policy and on leadership skills necessary for effective performance in areas of public health practice and public policy. (1.25 credits)

**MCH 298cd. Issues in Minority Health Policy (J. Reede, R. King)**

Explores public policy issues affecting the health status of minority and disadvantaged populations, emphasizing problem identification, policy analysis, and program planning. (2.5 credits)

**Independent Study, Field Experience**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research, undertake specialized readings, perform field projects, or carry out independent studies. Formal tutorials are offered in the areas of clinical effectiveness and infant assessment in the context of prenatal exposures.

**Department of Nutrition****NUT 201b. Principles of Nutrition (C. Lo)**

Emphasizes basic concepts of nutrition from epidemiologic, clinical, metabolic, and international perspectives. Topics include nutritional assessment, malnutrition, obesity, eating disorders, and relationships between nutrition and cancer and heart disease. (2.5 credits)

**NUT 202cd. The Science of Human Nutrition (F. Sacks, C. Lo)**

Reviews the biochemistry of carbohydrates, fats, proteins, vitamins, and minerals in the context of human disease. Emphasizes current knowledge of the mechanisms that may explain the role of diet in the

causation and/or prevention of ischemic heart disease, diabetes, obesity, hypertension, and cancer. (5 credits)

**NUT 203ab. Nutrition Seminars I (W. Willett)**

Focuses on the development of methods and the analysis and interpretation of nutritional epidemiologic data. (1.25 credits)

**NUT 204cd. Advanced Topics in Nutrition I (G. Hotamisligil)**

Enables students to review and analyze recent key papers providing either epidemiological or laboratory evidence that bears on a topic of current interest in human nutrition. Teaches skills necessary for oral presentation. (2.5 credits)

**NUT 205ab. Advanced Topics in Nutrition II (H. Campos)**

Extends NUT 204cd by allowing students to participate in and present seminars reviewing current research and publications related to nutrition, and to attend advanced seminars presented by faculty and guest speakers. Provides practical training in communication skills for oral presentation. (2.5 credits)

**NUT 206cd. Nutrition Seminars II (W. Willett)**

Describes current topics in nutrition. Usually taken by second-year doctoral students. (1.25 credits)

**NUE 207cd. Scientific Writing in Nutrition and Epidemiology (M. Stampfer)**

Covers organization of scientific papers, presentation of data in graphical and tabular forms, and style. Designed for advanced students beginning to work on a paper for publication. (2.5 credits)

**NUT 209ab. Seminars in Food Science and Technology (C. Lo)**

Examines the effects of genetic engineering, agriculture, food preservation and storage technology, marketing practices, and cooking on diet composition and public health. (2.5 credits) Not offered 2000-01.

**NUT 210cd. Nutritional Problems of Less-Developed Countries (W. Fawzi)**

Discusses the nutrition problems of less-developed countries. Reviews the epidemiological, biological, and behavioral consequences of malnutrition. Emphasizes infectious disease and perinatal outcomes,

including issues relevant to the formulation of nutrition policy and programs. (2.5 credits)

**NUE 212b. Nutrition and Heart Disease (F. Sacks, E. Rimm)**

Covers the relationship between diets, nutrients, and cardiovascular disease from the perspectives of epidemiology, clinical trials, and metabolism. Topics include dietary fats, minerals, antioxidants, the folate/homocysteine system, alcohol, hypertension, and stroke. (1.25 credits)

**NUT 214abcd. Research Techniques in Nutritional Biochemistry (M. Wessling-Resnick)**

Enables students to rotate through the laboratories of faculty members in the nutritional biochemistry program in order to learn current techniques applied to nutritional, cellular, and biochemical research. (10 credits)

**NUE 216cd. Nutritional Epidemiology I (W. Willett, F. Hu)**

Reviews methods for assessing the dietary intake of populations and individuals. Students gain experience in the collection, analysis, and interpretation of dietary intake data and learn to integrate information from international studies, secular trends, clinical trials, analytical epidemiology, and animal experiments. (2.5 credits)

**NUE 218ab. Nutritional Epidemiology II (A. Ascherio)**

Addresses methodological aspects of research in nutritional epidemiology. Topics include validation studies, adjustment for energy intake, and correction of measurement error. (2.5 credits) Not offered 2000-01.

**NUT 220d. Molecular Biology Laboratory Techniques (M. Wessling-Resnick)**

Provides hands-on training in modern molecular research, including PCR, RFLP analysis, DNA sequencing, and interpretation of results. Emphasizes fundamentals of laboratory procedures. (2.5 credits)

**NUT 301ab, cd. Nutrition/Health Promotion in the Mass Media (L. Cheung)**

Focuses on the role of the mass media in the promotion and adoption of healthy eating practices. Examines the import of the extent and quality of coverage in various mass media outlets, strategies for creating messages for mass media

use, and the effectiveness of existing mass communication campaigns in nutrition. (Credit to be arranged)

#### **Independent Study**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in department research or to undertake specialized readings or studies in the following areas: nutrition and other environmental factors in the etiology and management of diabetes mellitus (G. Herrera-Acena); the surveillance and epidemiology of nutrition in industrialized and developing countries (K. Peterson); regulation of the cellular uptake of macromolecular nutrients (M. Wessling-Resnick); nutritional epidemiology (W. Willett); and regulation of the altered amino acid metabolism that occurs in catabolic disease states (W. Souba).

### **Department of Population and International Health**

#### **PIH 200a. Population and Health (D. Bloom)**

Teaches the population-based approach to give insight into international public health issues. Examines health and mortality transitions in developed and developing countries; links between fertility, mortality, and reproductive health; fertility and family-planning programs. (2.5 credits)

#### **PIH 202b. Population, Health, and Development (A. Hill)**

Examines the relationships between population change and development in history and in the contemporary world. Reviews the causes and consequences of the demographic transition in developing countries, and assesses the relationships between gender differences and other inequalities to demographic patterns. (2.5 credits) Not offered 2000-01.

#### **PIH 203bc. Computer Methods for Demography and International Health (S. Atwood, U. Larsen)**

Covers computer techniques required for the design, collection, management, and analysis of types of data commonly encountered in population and health surveys in developing countries. Provides students with the computer skills needed in courses such as PIH 221c and PIH 222d. (2.5 credits)

**PSB 205cd. Disaster Management (J. Leaning)**  
Prepares those responsible for on-the-scene, immediate, acute intervention during disasters by focusing on decision making under stress. Examines case studies within the theoretical framework of disaster planning, response, and assessment. (2.5 credits)

#### **PIH 211b. Management Control in Health Organizations (M. Mitchell, P. Campbell)**

Introduces topics needed in understanding finance and management of health care in low- and middle-income countries. Focuses on skills needed by health care managers and covers cost and financial analysis, budgeting and control, and performance monitoring. (2.5 credits)

#### **PIH 214d. Health, Human Rights, and the International System (S. Marks)**

Provides an overview of the nature and role of international norms, processes, and institutions with respect to health and human rights issues. Explores the dialectical relation between the pursuit of national interests by governments and the rhetoric of global objectives by agencies that include health or human rights within their mandates. (2.5 credits)

#### **PIH 218b. Health and Human Rights (S. Gruskin)**

Discusses the interactions between health and human rights, with particular emphasis on the implications of human rights for public health thinking and practice. Provides the basis for literacy about modern human rights, including core principles, key documents, institutions, and practices. (2.5 credits)

#### **PIH 219a. Development and Human Rights (S. Marks)**

Considers the impact of economic development on health and human rights and the problems involved in achieving these rights in developing societies. Topics include the human right to development, conditionalities of foreign aid, corruption, housing, gender issues, and ethnic conflict. (2.5 credits)

**PIH 220b. Introduction to Demographic Methods (U. Larsen)**  
Presents the main demographic approaches to the study of population structure and dynamics, including data sources, age and sex composition, population growth, fertility, nuptiality, mortality, and population projections. (2.5 credits)

#### **PIH 221c. Fertility Analysis (U. Larsen)**

Covers techniques in fertility analysis and the various data sources used to estimate and interpret levels and differentials of fertility. Emphasizes underlying assumptions, application of methods, and interpretation of results. (2.5 credits)

#### **PIH 222d. Mortality and Health Status in Developing Countries (A. Hill)**

Outlines the problems of measuring population health and describes mortality levels, trends, differentials, and some principles involved in assessing the main causes of death and morbidity in developing countries, especially Africa. Focuses on the practical rather than the theoretical. (2.5 credits)

#### **PIM 233b. Biological and Clinical Foundations of Reproductive Health (I. Aitken)**

Introduces the anatomy and physiology of human reproduction and covers the essential clinical features of common complications of pregnancy, childbirth, and reproductive tract infections. (2.5 credits)

#### **PIM 234d. Reproductive Health in Developing Countries: Maternal and Perinatal Health (I. Aitken)**

Covers the biology and epidemiology of maternal and perinatal health problems in developing countries. Teaches students to evaluate the absolute and relative importance of causes of obstetric morbidity and mortality and of low birth weight, and to evaluate the effectiveness of prevention strategies. (2.5 credits)

#### **PIM 238c. Reproductive Health in Developing Countries: Family Planning and Sexually Transmitted Infections (I. Aitken, S. Kapiga)**

Examines the biological, epidemiological, social, and organizational bases of programs for family planning and control of sexually transmitted diseases. Also explores the effects and implications of aspects of health sector reform on policy-making and program management. (2.5 credits)

**PIP 240d. Political Economy of International Health Policy (M. Reich)**  
Examines issues of health and development in the context of international politics and economics. Explores ways in which relations between developed and developing countries affect the formulation and implementation of health policy. (2.5 credits)

#### **PIH 241c. Health Planning in Developing Countries: Cost-Effectiveness Analysis and Priority-Setting Techniques**

Teaches applied skills needed for the economic evaluation of health projects, interventions, and programs. Emphasizes cost-effectiveness and its use in sectoral resource allocation decisions, including ethical underpinnings. (2.5 credits)

#### **PIH 244b. Health Sector Reform: A Worldwide Perspective (P. Berman)**

Surveys the impact of the global movement to reform national health care systems on lower-to middle-income countries. Introduces a framework for analyzing health care systems and designing strategies for system reform, and examines some of the major elements of reform strategies with specific references to these developing countries. (2.5 credits)

#### **PIH 245ab. Population and Development Policies: A World of Contention (G. Zeidenstein)**

Covers the development and implementation of population policies within the broader context of international development activities. Topics include the United Nations, ethical considerations, environment, security, gender and sexuality, reproductive health and family-planning programs, shifting U.S. positions, resources, and implementation. (2.5 credits)

#### **PII 250b. Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries (R. Cash)**

Reviews the epidemiology of infectious diseases of public health importance in developing countries. Emphasizes epidemiologic patterns of bacterial and viral diseases as they relate to different geographic and socioeconomic environments. (3 credits)

**PIH 251d. Assessing the Impact of Health Interventions on Mortality and Morbidity in Developing Countries (A. Hill)**

Introduces the principles and practice of monitoring and evaluating health programs and interventions in developing countries and their impact on mortality and morbidity. Covers practical problems in designing and conducting evaluation studies and draws on relevant computer software. (2.5 credits)

**PIH 253b. Human Ecology (R. Levins)**

Provides a broad overview of the human ecosystem as it emerges out of, but differs from, prehuman ecology. Topics are selected from biosphere processes, population interaction, agricultural systems, adaptation evolution and ecology of disease, ecological politics, and evolution. (2.5 credits)

**PIH 257d. New and Resurgent Disease (R. Levins, T. Awerbuch)**

Covers new and resurgent disease as a general problem of evolutionary ecology and social change. Topics may include environmental change and disease, population change, organismic change, population and individual vulnerability, vectors, eco-social models, and research and public health strategies. (1.25 credits)

**PIH 258b. The Frontiers of Knowledge in HIV/AIDS Prevention, Care, and Research (S. Kapiga)**

Acquaints students with the current state of knowledge and future directions in HIV/AIDS epidemiology, prevention, care, and research. Covers the scientific, technical, programmatic, and policy aspects of the global response to HIV/AIDS. (2.5 credits)

**PIH 261cd. Mathematical Models in Biology and Public Health (R. Levins, T. Awerbuch)**

Examines mathematical models as a basis for analyzing biological and social phenomena relevant to public health. Topics include the spread and maintenance of infectious diseases, and diffusion bioassays for determining toxicity and mutagenicity of drugs. (2.5 credits)

**PIH 263e. Grant Writing for Funding of Research and Health Care Projects (K. Dumbaugh, R. Cash)**

Provides participants with the opportunity to prepare a grant proposal for submission to a funding agency, a framework for writing proposals for research or other projects, and information about organizations that fund such work. (1 credit)

**PIH 267c. HIV/AIDS in Developing Countries: Epidemiology and National Responses (S. Kapiga)**

Describes the distinct features of the HIV/AIDS epidemic in developing countries and the evolution of national responses to the disease in selected countries. Focuses on sub-Saharan Africa. (2.5 credits)

**Independent Study**

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research, undertake specialized readings, or carry out independent studies.

### Master of Public Health

**ID 250. Ethical Basis of the Practice of Public Health**

**ID 250a. (M. Roberts)**

**ID 250b. (M. Reich)**

Provides a broad overview of the main philosophical and moral ideas that are used to resolve debates of public health policy. Helps students develop the capacity to analyze, criticize, evaluate, and construct policy-oriented arguments. (2.5 credits)

**ID 251t. Ethical Basis of the Practice of Public Health: Health Care Delivery (T. Brennan)**

Emphasizes U.S. health care policy and modern medical ethics to explore the political theory of medical care. Helps health professionals understand the manner in which political economy and ethics interact in health care policy decisions. (2.5 credits)

**ID 261cd. Practice of Health Care Management (J. Kasten, J. McDonough)**

Offered through two sections: one focuses on the managerial skills required of public health professionals, including leadership negotiations, interdisciplinary teams, and communication. The other section explores the policy-making process

from a political perspective. Field-work for both sections provides practical experience in health care management or health policy development. (5 credits)

**ID 262a. Introduction to the Practice of International Health (R. Cash)**

Defines the scope of international health, highlights contemporary issues, and reviews case studies of policies and practices. Topics include world health and development, health transitions, disease control, primary health care, child survival, essential drugs, health policy, and evolving roles of international and nongovernmental organizations. (2.5 credits)

**ID 263cd. Practice of Occupational Health (T. Smith, R. Herrick)**

Focuses on the assessment of workplace hazards, the physiology and biomechanical aspects of work, and a practical problem-solving approach to health problems in various work settings. Emphasizes the relationship between working conditions and health, with special reference to the recognition, measurement, and control of occupational hazards. (5 credits)

**ID 264bcd. Practice of Family and Community Health (I. Aitken, J. Kurland)**

Enables students through fieldwork to apply managerial and analytic techniques to problems confronting public or community health agencies. (3.75 credits)

**ID 265c. Practice of Quantitative Methods (R. Monson, M. Testa)**

Explores practical and conceptual issues in the design, conduct, analysis, and evaluation of human studies through the discussion of current research and methodologies. Students design studies to address important health problems. (2.5 credits)

**ID 270t. Summer MPH Practicum and Culminating Experience (E. Cook, M. Stampfer)**

Applies competencies learned by students in the summer-only MPH program to an actual investigation. Students ordinarily write a paper suitable for publication, a grant proposal, or a technical report and give a formal presentation of the findings of the practicum during the final summer of their program. (5 credits)

**ID 330f. Field Trip**

Gives students an overview of the activities of the Centers for Disease Control and Prevention (CDC) in Atlanta and an opportunity to meet individually with professional staff. Sessions address such disciplines as occupational diseases, surveillance systems, epidemiology, control measures for chronic and infectious diseases, and CDC's role in international health. (1 credit)

**ID 336t. Field Study: Public Health in Cuba (I. Aitken)**

Offers opportunity for students to visit Cuban institutions such as the ministry of public health, schools of medicine and public health, health research institutes, an AIDS sanitarium, and community health clinics. (1.25 credits)

### Division of Biological Sciences

**DBS 201b. Interface of Biology and Public Health: Core Knowledge for the 21st Century (D. Wirth)**

Examines the underlying biological mechanisms relevant to major public health problems. Emphasizes fundamental aspects of modern biological sciences, particularly those important for public health professionals and decision makers. This course is for all students who plan professional careers in public health. (2.5 credits)

**DBS 205ab. Biological Sciences Seminars (M. Grusby, I. Ho)**

Presents current research by faculty members in carcinogenesis, DNA damage and repair, immunology, molecular biology, metabolism, cardiovascular disease, and parasitology. Includes discussion of the logic and design of this research. (5 credits)

**DBE 208cd. Pathophysiology of Human Disease (L. Kobzik)**

Surveys disease problems in the cardiovascular, respiratory, hematopoietic, reproductive, and gastrointestinal systems. Emphasizes the pathophysiology of disease manifestations, the pathogenesis of the disease process, and public health perspectives. (5 credits)

**DBN 209a. Membrane Trafficking (M. Wessling-Resnick)**

Presents a molecular overview of the elements involved in membrane traffic, describes how pathways are interconnected, and explains how

regulatory mechanisms maintain cellular integrity through membrane traffic. (2.5 credits)

**DBS 211cd. Frontiers of Cardiovascular Biology (G. Reed, J. Leiden)**  
Examines key epidemiologic, genetic, and molecular studies that link thrombosis and cardiovascular disease. Topics include the epidemiology of heart attacks and stroke, the molecular regulation of thrombosis, and the growing understanding of differential genetic risk for these events. (2.5 credits)

**DBN 212a. Molecular Basis of Vascular Biology: Gene Regulation and Its Application to Gene Therapy (M. Perrella, N. Sibinga, M. Chin, M. Russell)**

Focuses on molecular regulation of genes important in blood vessel biology and development of vascular disease. Topics include regulation of genes for vascular development, angiogenesis, smooth-muscle-cell growth, and maintenance of vascular tone/vascular reactivity. (2.5 credits)

**DBS 231abcd. Interdisciplinary Seminar in Cardiovascular Disease Prevention (W. Willett, I. Kawachi)**

Covers research in cardiovascular biology, epidemiology, health policy, and social behavior. (5 credits)

#### Independent Study, Laboratory Rotations

Individual students or small groups of students who wish to go beyond the content of regularly scheduled courses may arrange with individual faculty members to participate in departmental research or to undertake specialized readings or studies. Offers hands-on experimental methods of research in the biological sciences and includes individual original laboratory work, assigned readings, and participation in seminars and journal clubs.

#### Other Interdisciplinary Offerings

**WGH 200c. Women, Gender, and Health (N. Krieger, S. Gruskin)**  
Focuses on constructions of gender and sex and their implications for understanding determinants of population health and creating healthy public policy. Demonstrates ways of conceptualizing gender in relation to biology and health using case examples pertaining to breast cancer, smoking, cumulative trauma disorders of the hands and wrists, HIV/AIDS, violence, access to health services, sexual health, reproductive health, and population policy. (2.5 credits)

**ID 201cd. Biology, Epidemiology, Economics, and Policy: Malaria (A. Spielman)**

Brings multidisciplinary approach to a major public health problem in international health. Students are introduced to strategies for vector control, diagnosis, chemotherapy, and vaccines within the context of the biology and epidemiology of malaria and from the point of view of social, political, and economic policy. (2.5 credits)

**ID 240c. Principles of Injury Control (D. Hemenway)**

Introduces a serious public health problem—intentional and unintentional injury—and provides a framework for examining control options. Specific categories of injuries are covered in detail. (2.5 credits)

**ID 267a. Practice of Infectious Disease Epidemiology (J. Maguire)**  
Presents epidemiologic aspects of work in progress on infectious diseases. Emphasizes conceptual issues. (1.25 credits)

## **Accreditation**

The Harvard School of Public Health is accredited by the Council on Education for Public Health.

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## **On-Line Resources**

A wealth of HSPH information can be accessed via the World Wide Web at [www.hsp.harvard.edu](http://www.hsp.harvard.edu). This Web site includes updated course, faculty, and educational information, and school news. Information about Harvard's other faculties can be found at [www.harvard.edu](http://www.harvard.edu).

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## **Official Register Volume 21, Number 8**

Every effort is made to ensure the information contained here in the *Official Register* is accurate at the time of publication. However, the Harvard School of Public Health reserves the right to make changes without notice in tuition and fees, admission and degree requirements, courses of instruction, and other information contained herein. These changes will govern all students, including students who matriculated prior to the changes coming into effect.

## **Nondiscrimination Policy**

As a matter of policy, law, and commitment, the Harvard School of Public Health does not discriminate against any person on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or handicap in admission to, access to, treatment in, or employment in its programs and activities. The following person has been designated to handle inquiries about nondiscrimination programs: Carolyn Everette, assistant dean for human resources, 677 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1046). Inquiries about the application of nondiscrimination policies concerning race, color, national origin, age, sex, or handicap may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack POCH, Room 222, Post Office Square, Boston, MA 02109.

## **Disabilities**

The university, in accordance with its obligations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, does not discriminate against qualified individuals with disabilities in admission or access to programs and activities. The Office for Students and Alumni assists all students with learning, manual, mobility, hearing, visual, and other disabilities.

## **Religious Holidays**

According to Chapter 151c, Section 2B, of the General Laws of Massachusetts, any student in an educational or vocational training

institution, other than a religious or denominational training institution, who is unable, because of his or her religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or requirement which he or she may have missed because of such absence on any particular day, provided that such make-up examination or work shall not create an unreasonable burden upon the school. No fees of any kind shall be charged by the institution for making such opportunity available to the student, and no adverse or prejudicial effects shall result to any student for availing himself or herself of these provisions.

## **Campus Security**

In compliance with the Student Right-to-Know and Campus Security Act of 1990, the Harvard University Police Department publishes an annual security booklet entitled "Playing It Safe." The booklet describes Harvard's security policies, provides statistical information on the occurrence of crime on campus, and outlines some of the counseling programs the university offers. Students may obtain a copy of this booklet from the HSPH Admissions Office, 677 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1031).

## **Voter Registration**

Massachusetts state law, as set forth in Chapter 51, Section 42E (Section 17 of Chapter 475 of the Acts of 1993), requires educational institutions to make available affidavits of voter registration. Eligible students may register to vote at registration, and mail-in registration affidavits are available from the Registrar's Office. Students from other states who desire to vote in a state other than Massachusetts may use the federal mail-in affidavit of voter registration or a mail-in form supplied by the state. These students must contact the appropriate state election official to receive the state form or may contact the Massachusetts Elections Division, Room 1705, McCormack Building, One Ashburton Place, Boston, MA 02108, for a federal form.

## Harvard School of Public Health – Academic Calendar, 2000–01

July 5	Registration for summer programs
July 6–August 18	Summer Program in Clinical Effectiveness (see page 53 )
July 6–August 18	Summer Session for Public Health Studies (see page 53)
August 21–September 1	English for Professional Communication (see page 52)
September 6–15	Strategies for Success orientation program (see page 52)
September 11	Fall semester registration for new and returning students
September 11–15	New student orientation
September 18	<i>a</i> and <i>ab</i> period courses begin
October 9	Columbus Day, a holiday
November 9	<i>a</i> period courses end
November 10	Veterans Day, a holiday
November 13	<i>b</i> period courses begin
November 23–26	Thanksgiving recess
December 15	Deadline for application to all doctoral (PhD and SD) and master of science (SM) programs; deadline for application to master of public health (MPH) and master of occupational health (MOH) programs in priority admission cycle
December 21–January 1	Winter recess
January 15	Martin Luther King, Jr., Day, a holiday
January 19	<i>ab</i> and <i>b</i> period courses end
January 22–26	<i>e</i> period (optional special studies and field trips)
January 29	<i>c</i> and <i>cd</i> period courses begin
February 19	President's Day, a holiday
February 28	Final deadline for completing application to MPH and MOH
March 23	<i>c</i> period courses end
March 26–30	<i>f</i> period (optional special studies and field trips)
April 2	<i>d</i> period courses begin
May 25	<i>cd</i> and <i>d</i> period courses end
May 28	Memorial Day, a holiday
June 7	Commencement

Harvard School of Public Health  
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